WOOD WORKING Digest

JULY
1955

In This Issue . . .

Washington News

Finishing Stories

Fundamentals of Wood Machining

Business In a Showcase

Complete index page 5

THE INDUSTRY'S *No.1* PUBLICATION

in

- Editorial Content
- Advertising Volume

ST LOUIS PUB LBRY
CATALOGUE & ORDER DEPT
OLIVE 13TH & 14TH STS
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1898

A HITCHCOCK PUBLICATION

DRIVE STANDARD I[illegible]
ROU[illegible]

NEW PORTABLE AIR DRIVE SPOTNAILERS AND

[illegible]MATICALLY!

[illegible]ne dependable, production-tested Spotpinner auto-matically drives—and countersinks [illegible] familiar round 12 gauge [illegible] millwork at [illegible]

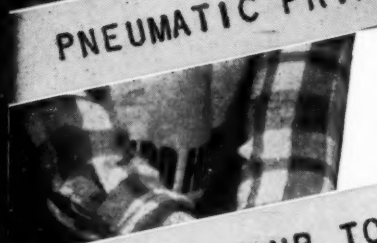
SPOTPINNERS EMPLOY NEW HIGH VELOCITY

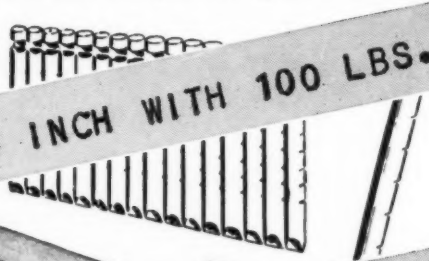
The new Spotpinner has a double capacity magazine contained entirely within its virtually indestructible molded frame.

Spotpi[illegible]

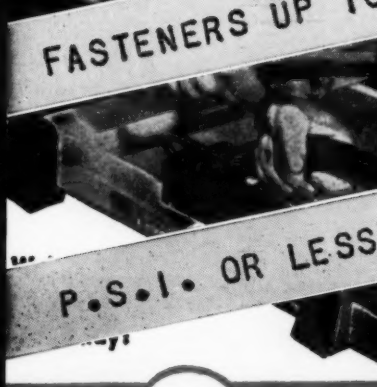
PNEUMATIC PRINCIPLE• DRIVE ALL SPOTNAILS

[illegible]—chiselpointed [illegible]g check rails and muntins. [illegible]potpins are round, straight (no offset) and cohered in sticks for quick magazine loading.





FASTENERS UP TO 1-1/4 INCH WITH 100 LBS•

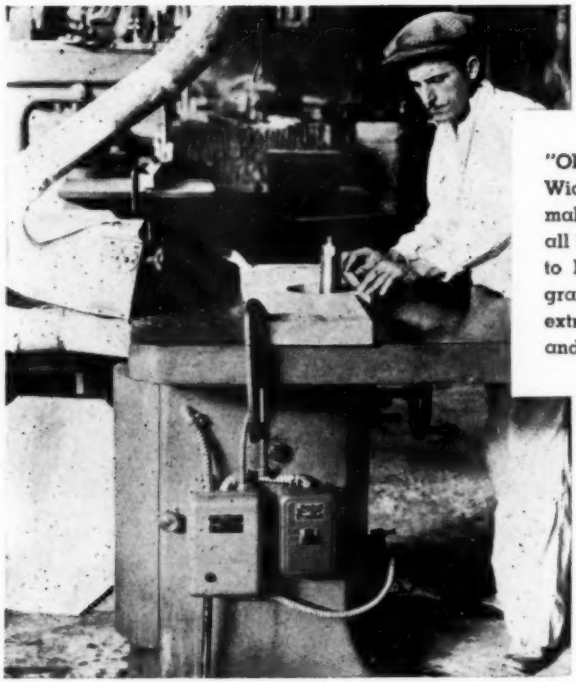


P•S•I• OR LESS• SEE YOUR SPOTNAILS MAN=

Spotpins are made in standard ⅞", 1" and 1⅛" sizes.

SPOTNAILS, INC. EVANSTON 1, ILL.

"OLIVER" SINGLE SPINDLE SHAPER



"Oliver" No. 287T Shaper at the Widdicomb Furniture Company makes light and heavy cuts on all kinds of stock from basswood to hard maple, cutting with the grain or against it. The work is extra smooth with no tearing, and requiring little sanding.

. . . delivers fast and smooth work on light and heavy cuts

This "Oliver" Shaper has many of the advantages of a two-spindle machine. It rabbets, grooves, routs and shapes with speed and accuracy. Choose from three types of drive: motor-on-arbor for speeds up to 8400 r.p.m., close-coupled motor drive for spindle speed of 7200 r.p.m., and V-belt drive for spindle speeds of 6000 r.p.m. or less. Write for Bulletin No. 287T.

The "Oliver" Double-Spindle Shaper makes all types of cuts, and can be fitted with four-knife cutterheads up to 24 inches long. Get all the facts.

OLIVER MACHINERY COMPANY

Established 1890 **GRAND RAPIDS 2, MICHIGAN**

CRAWFORD FURNITURE MANUFACTURING CORPORATION / JAMESTOWN, NEW YORK

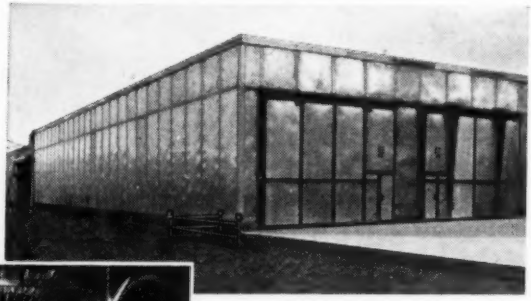
Crawford of Jamestown

CHOOSES Standard PREFABRICATED DRY KILNS

And no wonder! Compared with a good masonry building, the *Standard Prefabricated Dry Kiln* cuts steam radiation losses 50% or more . . . *resulting in tremendous fuel cost savings.*

To produce uniformly-dry lumber, efficiently and economically, take a tip from the folks at Crawford. Install *Standard Prefab Kilns* now. They can be *completely* installed in any size—from a small research kiln to a large production unit—in only a few days!

Right: The *Standard Prefabricated Dry Kiln* installation at the modern Crawford factory in New Bethlehem, Pa. The sturdy building is constructed of vapor-proof, rust-proof, heavily-insulated aluminum panels which *require no maintenance*. Entire building can be quickly and easily moved to a different location whenever desired.



Left: View of fan chamber showing *Standard's* cross-circulating, direct-driven internal fan units, properly placed to face side walls. Each ball-bearing motor is glass and silicone-insulated to withstand temperatures up to 356° F. and humidities up to 100%. Note fin pipe heating system.

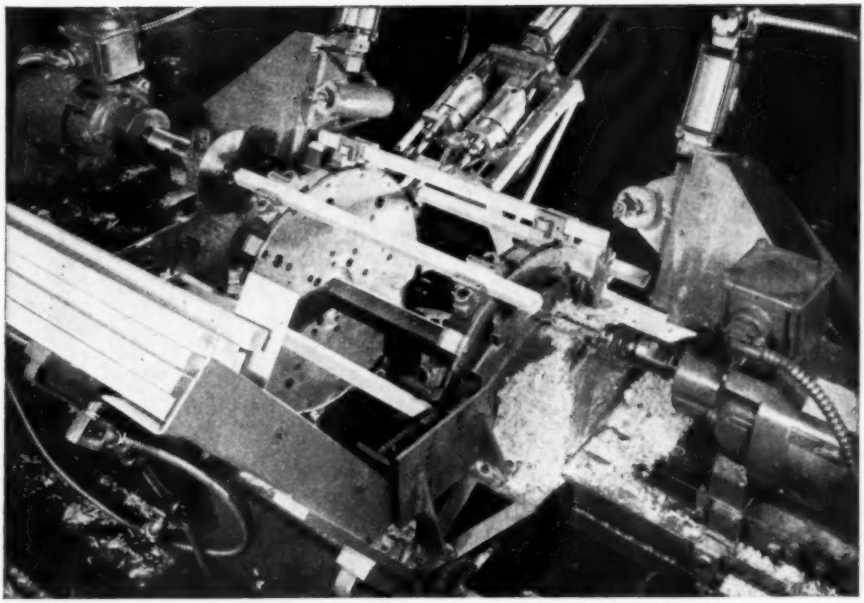
Write Today for Free, Illustrated Standard Catalog

STANDARD DRY KILN COMPANY

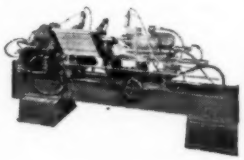
Engineers and Manufacturers Since 1887

P.O. BOX 5708 . . . INDIANAPOLIS 21, IND.

BRANCH OFFICE: REDMAN ENGINEERING SERVICE • HIGH POINT, N.C.



one pass: six machining operations continuously!



If you make furniture or chair parts, toys, or wood parts of special shapes, here's new high production for you—at big savings: the new Hawker rotary chucking machine does up to 6 different operations automatically and continuously. Operator just keeps the rack loaded. Work heads may be tooled to: cut to length, mill, tenon, taper, drill, slot, thread—at right angles *or* compound angles. Production rates from 2000 to 3000 per hour. Send in a part or blueprint, and ask for a quotation from Hawker on special machinery to do your job faster for less money . . . The Hawker Manufacturing Co., 1449 Keowee Street, Dayton 4, Ohio.

HAWKER

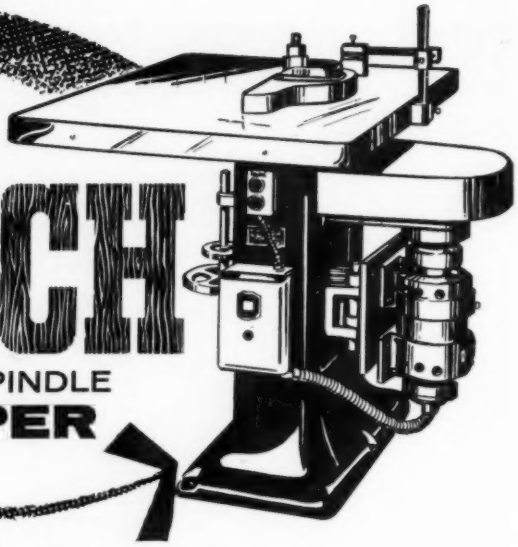
PRODUCTION MACHINES FOR WOOD: DOWEL, CHUCKING, SPECIAL

SPECIFY

BEACH

SINGLE SPINDLE

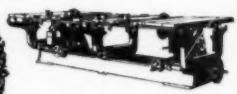
SHAPER



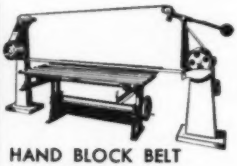
- **furnished with a solid spindle 1" diameter, accurately ground and balanced.**
- **complete set of knife and fill-in collars furnished; special spindles available on order.**
- **spindle and motor can be raised and lowered as a single unit.**
- **heavy cast iron table carefully machined and finished to give best possible working surface. Available in two sizes: Standard —30x40" with 15" clear in front of spindle; 24x40" with 13" clear in front of spindle.**

The Beach Single Spindle Shaper is adapted for all types of shaping and is built to give years of carefree operation. The Beach Shaper embodies several features not to be found on other machines of this type. Can be furnished with any type electric motor, from 1 H.P. to 5 H.P.

WRITE TODAY for complete information and specifications on the Beach Single Spindle Shaper!



DOUBLE CUT-OFF SAW

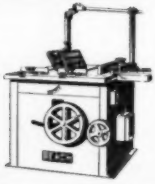


HAND BLOCK BELT SANDER

BEACH

MANUFACTURING CO.

MONTROSE, PA.



TILTING ARBOR SAW

TILTING TABLE SAW

WOOD WORKING Digest

JULY, 1955
Vol. 57, No. 7

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HIGH SPEED SHAPER STEEL

and **THIN KNIVES**

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MACHINERY AND TOOLS SINCE 1904

High Production Glue Spreaders

RESILIENT ROLL BALL BEARING GLUE SPREADER

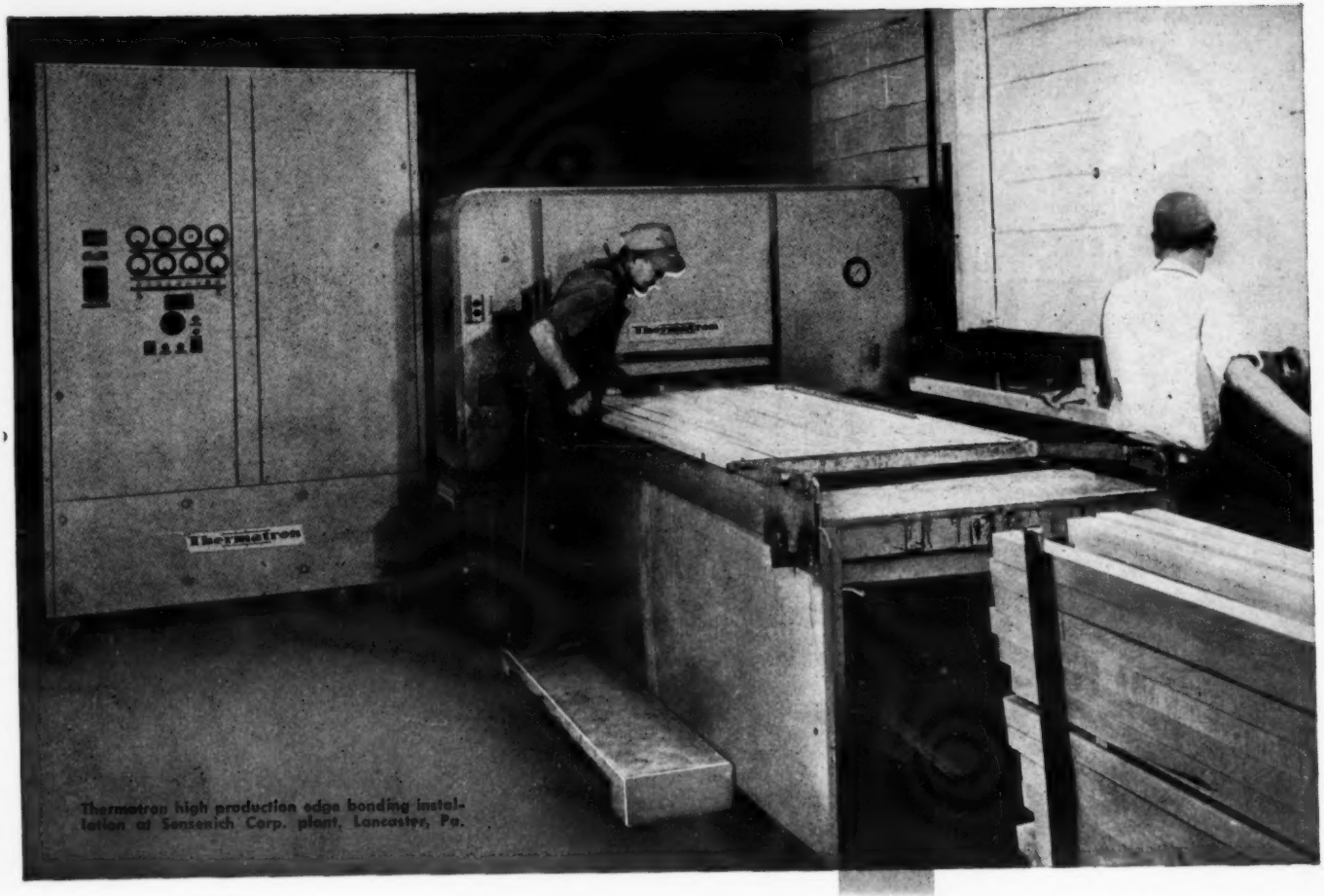
✻ **BLACK BROTHERS have built more resilient roll glue spreaders during the past fifteen years than all other manufacturers.**

Unmatched in speed, economy, accuracy, cleanliness and quality production . . . the No. 22D Ball Bearing, Resilient Roll Spreader is by far the finest glue spreader available for resins, caseins, and other cold glues. Gluing rolls are deeply covered with the fine synthetic rubber, and are specially grooved to control the amount of glue deposited and to conform to irregularities in the stock. Water cooled doctor rolls are available for use with quick setting glues. Accurate, heavy duty ball bearings are sealed to keep lubricants in, and dirt and glue out. Doctor rolls are heavily *coated* with a highly polished, nonferrous surface to accurately control the glue spread. Investigate the 22D Spreader today . . . write for supplement to Bulletin 11-A.

"If It Is Gluing Equipment — We Have It"

THE BLACK BROTHERS CO., INC.

MENDOTA, ILLINOIS, U. S. A.



Thermatron high production edge bonding installation at Sensenich Corp. plant, Lancaster, Pa.

For Edge Bonding

For Edge Bonding

in their brand new plant

CRAWFORD chose

Thermatron®

HIGH FREQUENCY GENERATORS AND PRESSES

WITH FULLY AUTOMATIC CYCLING AND POWER CONTROL

Crawford Manufacturing Corporation's new "1955 Model" furniture plant in New Bethlehem, Pa., was planned to take advantage of every technological advance available to the woodworking industry.

For such an essential part of their operation as edge bonding, Crawford engineers have selected THERMATRON equipment. Their own field surveys proved THERMATRON's automatic power control reduces production time even over previous *electronic* installations by a third or more.

This modern THERMATRON equipment accommodates a wide variety of loads, automatically adjusting to load conditions during the cycle. The exact status of work in process can be read easily on the control panel.

THERMATRON electronic generators and presses bond wood in less time than it takes to tell it, and there is equipment for just about every type of operation, large or small. Let us study *yours* without obligation to effect real savings. And please write for our latest bulletin on high frequency wood bonding — WD-48.

Thermatron Division

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In Radio and Electronics Since 1922

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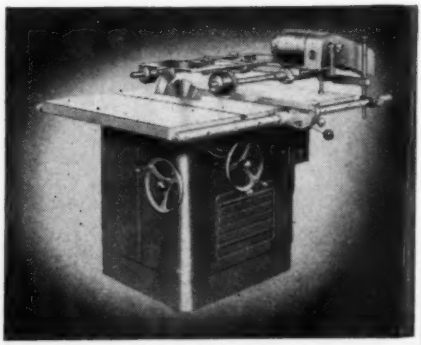
Break Production Bottlenecks

DELTA 12" Tilting Arbor Saw . . .

This rugged, heavy duty saw gives you greater capacity for production cutting. And with Delta's new Power Feed Unit, designed expressly for use with the Delta 12" Tilting Arbor Saw, you get an accurate, high-speed *production* ripping machine *at less cost* than most production table saws alone! Speeds from 20 to 90 feet per minute . . . straight, accurate cuts . . . safe, easy operation. And the unit quickly swings down out of the way for full use of the saw alone.



at Low Cost . . . with a

Rockwell-built DELTA Unisaw®

This low-cost, multi-purpose DELTA 10" Tilting Arbor Unisaw is designed to handle a large number of jobs—*throughout your shop*—on a fast, cost-cutting basis. It's built to give you all the speed, all the capacity, all the precision you need to do accurate cross-cutting and ripping—and with Delta's broad selection of accessories you can also cut dadoes, tenons, mouldings, and do many other jobs.

Because the versatile DELTA Unisaw is readily portable, you can use it anywhere in your shop—to eliminate bottlenecks—to reduce materials handling—to put greater flexibility into your woodworking operations. Yet, it's a rugged tool that will stand up under tough everyday use—and remain accurate year after year.

Let your Delta Dealer show you why the Delta Unisaw is the finest 10" tilting arbor saw made today—and how it can help you speed-up production—cut costs. He's listed under "TOOLS" in the classified pages of your phone book. Send the coupon for complete details.

Compare These Built-in DELTA Features...

- **BIG CAPACITY**
  cuts stock 3⅛" thick, rips to center of a 50" panel.
- **PERFECT ALIGNMENT**
  carriage swings on strong, heavy trunnions with working surfaces fully machined.
- **THREE-BELT DRIVE**
  transmits full power, eliminates vibration, assures smooth, efficient operation.
- **SAFE, CONVENIENT CONTROLS**
  easy to reach, safe to operate.
- **MASSIVE MITER GAUGE**
  has adjustable stops for mitering and straight cut-off, long guide bar for added accuracy.
- **SEALED, LUBRICATED-FOR-LIFE BALL BEARINGS**
  no lubrication problems.
- **DOUBLE LOCK FENCE**
  extends full length of table, locks front and rear with controls located at front; has micrometer adjustment.

DELTA QUALITY POWER TOOLS

Another Product by **Rockwell**

DELTA ROCKWELL

DELTA QUALITY COSTS NO MORE

Delta Power Tool Division, Rockwell Manufacturing Co.
666-G North Lexington Avenue, Pittsburgh 8, Pa.

- ☐ Please send name of my nearest Delta Dealer.
- ☐ Please send me Delta AB Catalog.
- ☐ Please send me descriptive sheet on new Delta Power Feed Unit.

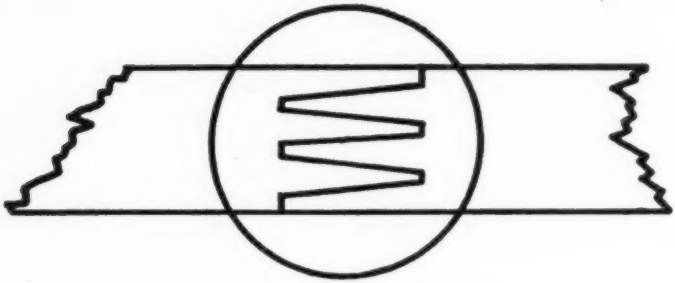
Name_____ Title_____

Company_____

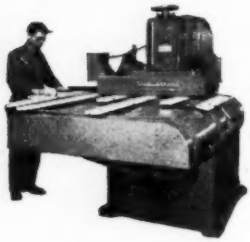
Address_____

City_____ County_____ State_____

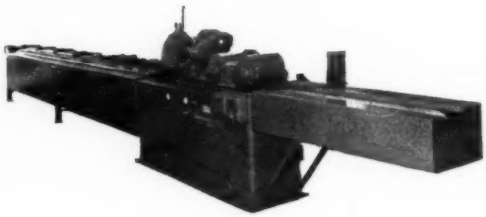
Continuous Finger Jointing At A Minimum Cost



Continuous production layouts for finger jointing, assembling and cutting to any predetermined length up to 16 ft. For the salvaging of short stock or utilizing a low grade of lumber. Micrometer adjustments for assuring accurate joints. Automatic glue applicator. Write for users list.



Finger Jointer



Assembly Machine

Exclusive Distribution

TRI-STATE MACHINERY CO.

3000 COMMERCE DALLAS, TEXAS

PHONE PRospect 3235

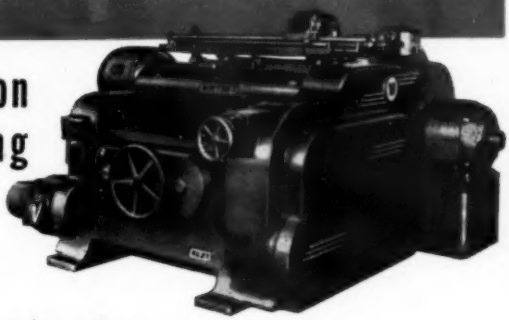
MANUFACTURED BY

INDUSTRIAL MACHINE MFG.

3008 COMMERCE

Nothing Compares with the WHITNEY 97 DOUBLE SURFACER

For quality production and low cost planing



Whitney 97 Double Surfacer
Feeds: 30 to 90 feet per minute
Planes stock ⅛" to 7" thick
Widths, 30" 36" 40" and 44"

The Whitney 97 Double Surfacer, the last word in modern planer design, is built to handle your double surfacing requirements. Its rugged proportions and faster feeds permit it to handle easily the volume production required in today's modern plant. Traditional Whitney accuracy and careful workmanship assure smooth, accurate planing, continuous production, low cost maintenance and the stamina to produce best results under the severest kind of service.

The Whitney 97 will bring to your plant a new conception of production efficiency and cost savings. High production quotas will be maintained and sanding and finishing costs substantially reduced. Investigate today the Whitney 97 for your double surfacing requirements. Write for full particulars. Ask for planer bulletin D 1.

Check these features

- Wedge Construction
- Nitralloy Center Table
- Ball and Roller Bearings thruout
- Motor Raising and Lowering of Bed
- Built-in Variable Speed Feed
- Micro-feed Selector
- Automatic Power Feed Grinder

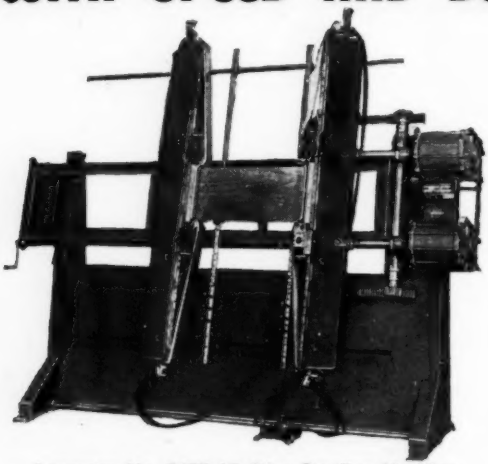
In our 117th year

Baxter D. Whitney & Son, Inc.
WINCHENDON, MASSACHUSETTS, U. S. A.
Quality Built Woodworking Machinery Since 1837

Planer Specialists
FOR MORE THAN 100 YEARS

PLANERS • SHAPERS • AUTOMATICS • VARIETY SAWS • BACK KNIFE LATHES

QUALITY EDGE BANDING
WITH SPEED AND DEPENDABILITY!



Lancaster No. 1425-A3 Edge Banding Machine

Here is an Edge Banding Machine with resistance heating which will give you high production quality work; thereby, saving you many dollars compared to using many conventional Edge Banding Machines.

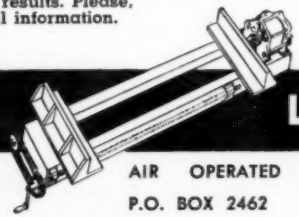
Our machine will band straight work up to a maximum of 3" thick, 80" wide and 80" long and round corner work up to a maximum size of 3" thick, 56" wide and 80" long. The No. 1425-A3 requires little floor space as it is constructed so that jaws form an easel with a 15° slant. This construction gives your operator every advantage for ease of operation. We have provided several sets of work support pins which can be used at any point along face of jaws. This will allow you to band several small or narrow tops at one loading. When banding thin tops you can place tops in machine in two layers by using spacer strips. The average time required for single ply veneer is 1 to 1½ minutes, for double ply veneer the time is 1½ to 2 minutes at 225° Fahrenheit.

Our present users are receiving outstanding results from the LANCASTER EDGE BANDING MACHINE. We would like for you to get these same outstanding results. Please, write for full information.

The Lancaster No. 260-B Glue Spreader is built to provide smooth trouble free performance. Its simple sturdy construction combined with the ability to produce a uniform regulated spread of glue is a great contribution to your edge banding operation. This machine will produce glued bands faster than most methods without getting undesirable glue on the face side of veneer.

Lancaster No. 260-B Motor Driven Edge Banding Glue Spreader.

We would like to send you further information on this equipment.



J. M. LANCASTER, INC.

AIR OPERATED FURNITURE CLAMPING MACHINERY

P.O. BOX 2462 • GREENSBORO, N. C.

Serving the Industry Since 1852

WOODS MOTORS are SUPERLATIVE

in

DESIGN
MATERIALS
WORKMANSHIP
PERFORMANCE

★ MOTORS

★ MOTOR ARBORS

★ SHAFTLESS MOTORS

2 and 3 phase 1-100 horsepower

Type L Motor Saw Arbor

This popular unit is being widely used for cross-cutting, ripping or dadoing operations, modernizing belt-driven machines, etc. Built in three diameters, 3¼", 4", and 5⅛", center line to flatted top or either side, it is rated from ½ to 15 HP at 3600 RPM or higher ratings and speeds when operated from a frequency changer. Oversize ball bearings with arbors up to 2¼" diameter are mounted to eliminate end play, operation may be horizontal or vertical and either totally-enclosed dust proof or ventilated construction can be supplied.

Write today for descriptive material or ask our Engineering Department the solution for any special motive problem.

MOTOR DIVISION

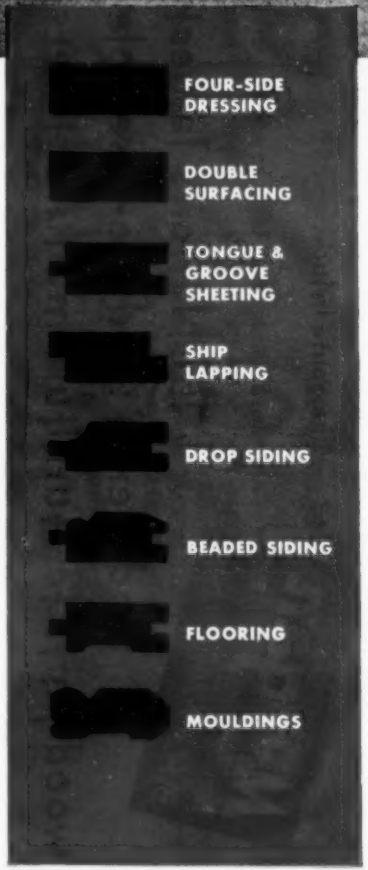
S. A. WOODS MACHINE CO.

27 DAMRELL STREET

BOSTON 27, MASS.

Breaking the NEWS
in
woodworking
machinery
FAY
& EGAN'S
new
Four-Side Planer
and
Double Surfacer
Model No. 969

Model No. 969
Ball-Bearing, Four-Side
Planer—Matcher—Moulder



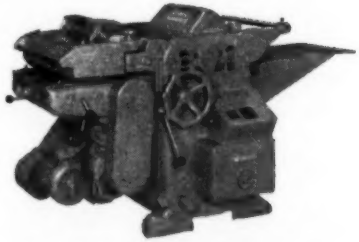
The new No. 969 "Four-Sider" illustrated above is just one of the versatile new series of modern style woodworking machines which will add automation to your production.

Operations that must be performed on four sides of stock, can be performed on the No. 969 in one operation. Planing width is 20 inches and planing thickness 8 inches.

This unit is also available in model No. 969A as a Double Surfacer. It is designed for fast double planing with a capacity 20″ wide, 8″ thick.

Outfeed tables are available to your specifications.

You'll want to know more about the new Four-Side Planer-Matcher-Moulder and new Double Surfacer. Write today for your copy of illustrated brochure.



No. 969A Double Surfacer

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WHEN your machines resemble dodos and a whopping investment looms . . . mention it to Morgan. If your needs and our equipment jibe, you're in luck!

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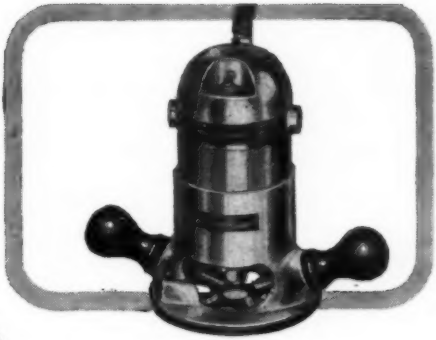
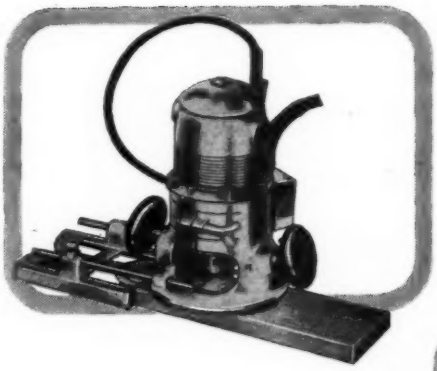




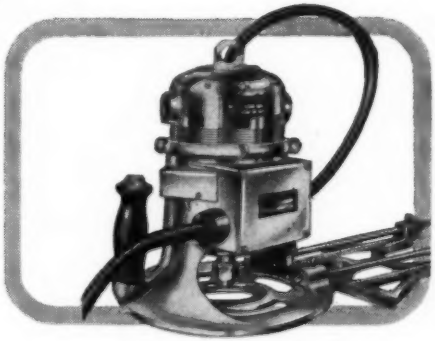
STANLEY ROUTER

No. R5B-1 H. P.

STANLEY ROUTERS

No. R22-2½ H. P.

No. R33-3 H. P.



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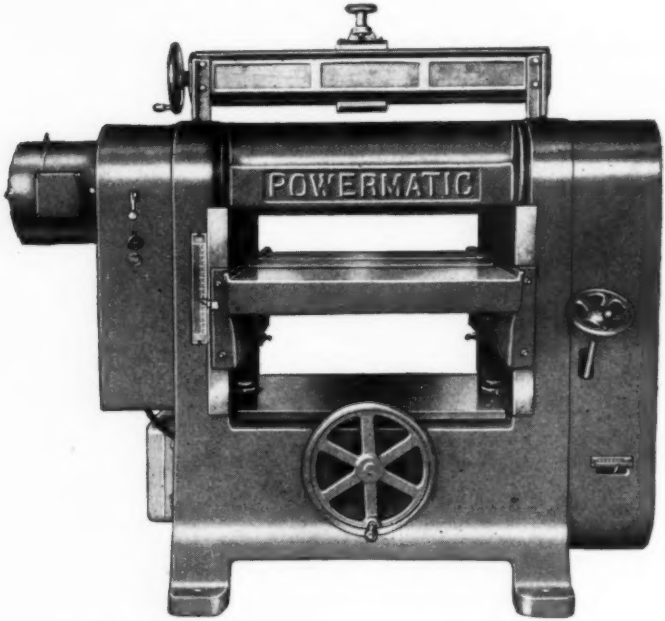

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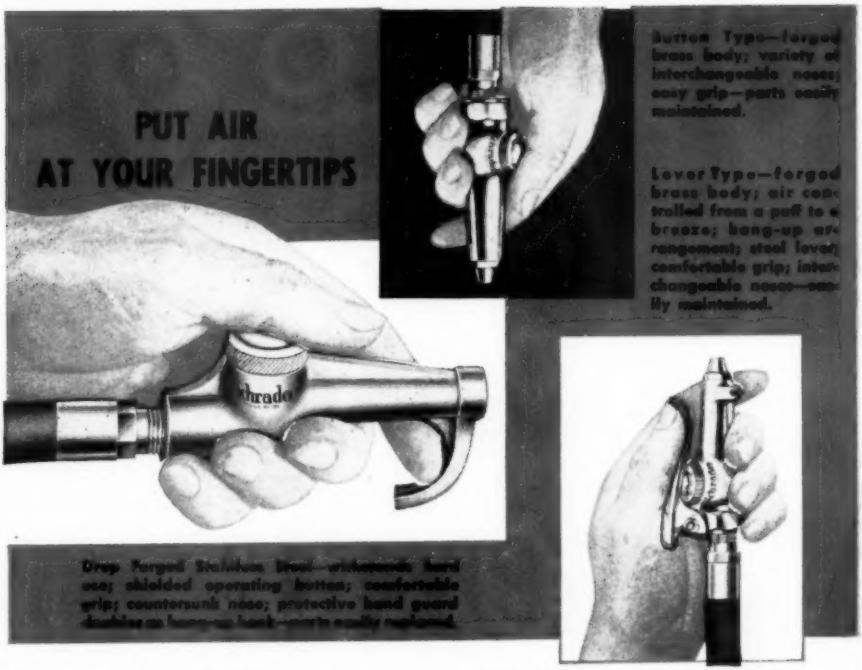
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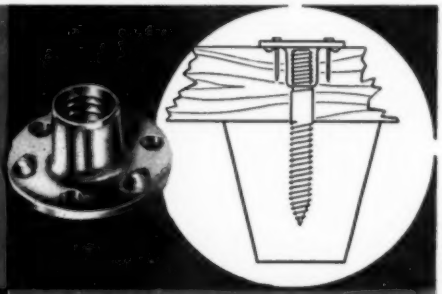
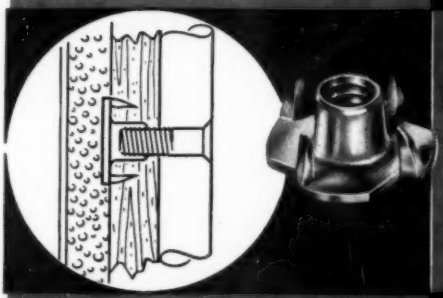
flush fasteners for furniture and general woodworking

Teenuts provide positive anchorage for bolts, can be used with or without counterboring and permit repeated assembly and disassembly without damage to wood. Simply drill hole size of Teenut barrel and hammer in the Teenut. Same size hole for bolt. Wide variety of thread sizes, barrel lengths, flange designs . . . can be supplied in volume quantities.

SHORT PRONG TEENUT

Can be held in place by brads until final attachment of components by dealer or consumer. Short prongs prevent turning when hanger bolt is tightened.





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Prongs are curved for twisting action as Teenut is driven, provide extra holding power in wood. Chair back or seat are easily assembled or disassembled.

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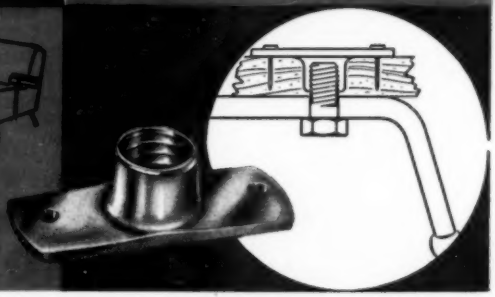
Has narrow base for use in limited spaces. Held in place by brads instead of prongs. Specially designed for heavy duty applications.



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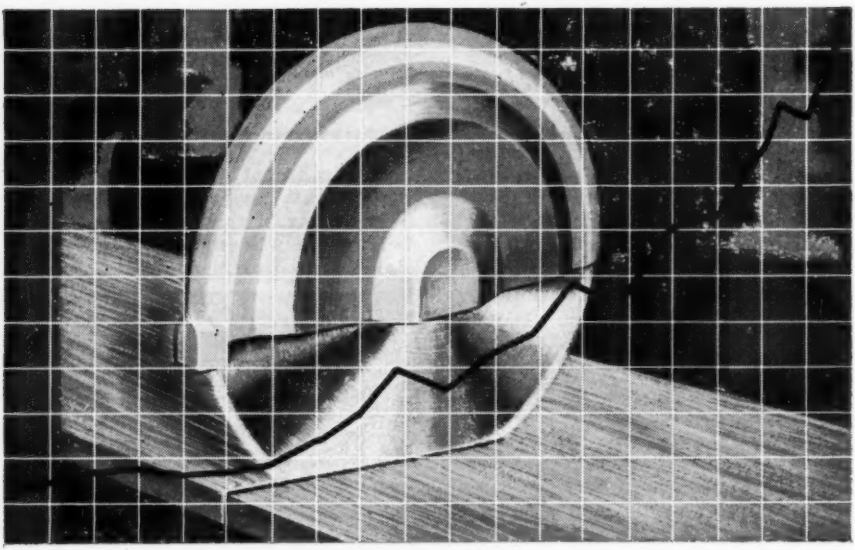

When Radialloy-Tipped* circular saw blades don't break production records—that's news!

These super-finished, diamond-ground Radialloy-Tipped* Blades operate faster, smoother, without any vibration on "tough sawing" materials because they skillfully combine the highest quality heat-treated, precision-ground, steel blade with permanently brazed wear-resistant carbide tips. And to assure maximum support and safety, each Radialloy tip has full steel backing and a specially designed safety lock which prevents the tip from flying off.

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Visit us at the National Association of Furniture Manufacturers' Show in the Conrad Hilton Hotel, Chicago, Illinois, from August 28 to September 1, Exhibit Booth #46, for an actual demonstration of the superior cutting quality of these blades on wood and plastic laminate materials. However, if you can't make the show, we'll be pleased to furnish sample cuts of the materials you send us.

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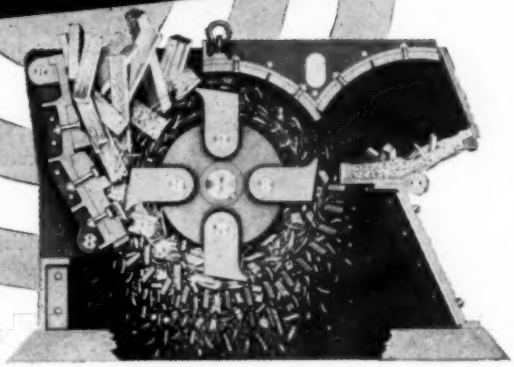
SPECIALISTS AND LEADING MANUFACTURER OF CARBIDE-TIPPED SAW BLADES

MAKE A 2-Way Profit ON WOOD SCRAP!

WILLIAMS "No-Nife" HOGS



Cross section of "No-Nife" Hog showing how fast-revolving chisel-edge hammers reduce wood by impact until properly sized to pass through grate at bottom of machine.

1 Waste wood, automatically conveyed and hogged on Williams equipment, reduces disposal costs up to 75%! One man can handle as much tonnage in chips as three men can handle in awkward pieces and lengths.

2 **If used for fuel,** scrap wood hogged on a Williams is completely combustible, yields maximum BTU's, gives 100% heating value. Unhogged scrap restricts air flow, burns unevenly, smothers the fire, causes excessive smoke.

If sold in chip form to chip board manufacturers, wood refuse processed in a "No-Nife" Hog becomes a top quality product, uniformly ground and sized, and commanding highest prices.

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New Carboloy® Woodworking Manual

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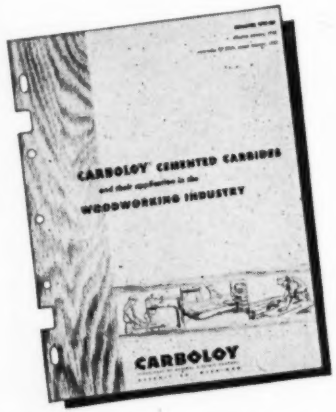

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Here are the contents:

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What are Cemented Carbides?	
Manufacturing Process	4
Grain Structure Comparison	5
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Represented in the Entire Knife Line. And Introducing a New High Speed Steel Thin Knife

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TUNGSTEN TEMPER

An entirely new and improved High Speed Steel Thin Knife is now being presented by the Stalter Edge Tool Company under the well known name of Tungsten Temper.
To provide a better knife Stalter has added an exclusive new NON-SLIP back. Metallurgical study has increased the edge strength. Order a set of Stalter Thin Knives and prove the advantages in your own plant.
The same new developments are incorporated in the Stalter Shaper Steel. The apex in shaper steel manufacture.

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For use on modern fast moulders and stickers the Stalter Tungsten Temper (High Speed) or Thermo Temper (Carbon) provides the finest in slotted thick knives.

THERMO TEMPER

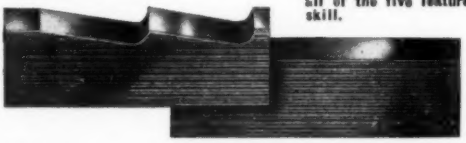
High Speed or Carbon Steel Planer Knives can be furnished to your specifications. Stalter Planer Knives can be supplied solid or inlaid. Write our engineering department for their recommendations.

Tenon Knives furnished in High Speed or Carbon Steel, when made by Stalter, are the tops in durability, balance, and stamina.

Accurate interpretation of your patterns, ground into one of the selected Stalter Knives, provides you with trouble free operation. Send Stalter your pattern or sample.

Shaper knives made from Stalters premium shaper steel insures long lasting edges and safe operation.

Corrugated knives, ground-to-pattern, straight or bar length includes all of the five features of the Stalter knife making reputation and skill.



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AIM* for safe, easy, profitable operation

AIM* for a faster, more flexible packaging system with Acme Steel Strapping

*Acme Idea Man, S. P. Boland, Grand Rapids, continually services and recommends new ideas and strapping improvements to all his customers

ask your
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to help solve your problems

By changing their packaging method, Grand Rapids Chair Division of Sligh Furniture Co., cut furniture packaging time by one third. (Idea 453.) With the steel strapped package, costs were trimmed . . . shipping weight was reduced by as much as 40%.

A big advantage of Acme Steel strapping is its versatility, and in this case lends itself to the flexibility of wrapping the package. You can strap a wide variety of shapes, sizes and patterns. Customers approve because steel strapped packages arrive in first class condition. And they are much easier to open.

Your Acme Idea Man is a strapping specialist. He will gladly analyze your present system, demonstrate the excellent Acme Steel tools and recommend the best strapping method for you . . . all without obligation. Consult your classified telephone directory for your nearest Acme Idea Man. Or write for further information to Dept. CX-75.

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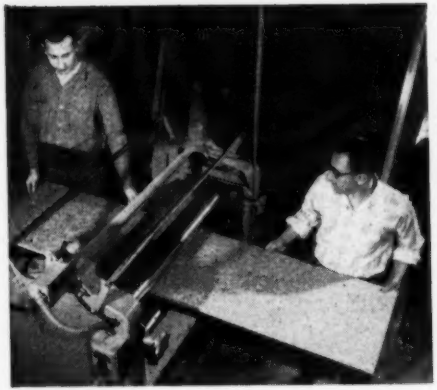
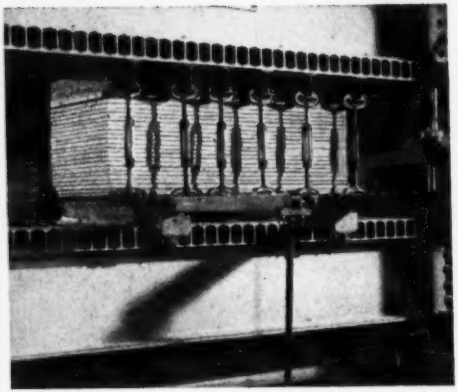
ACME STEEL

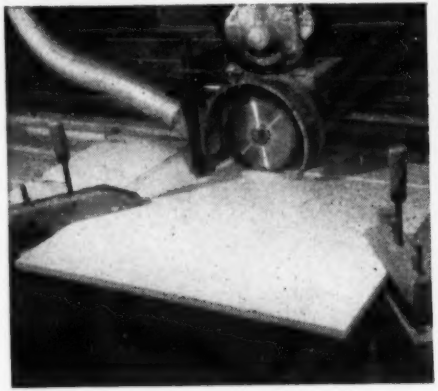


Glue spreads easily on Novoply surfaces and you actually use *less* glue for a really tight laminating bond.

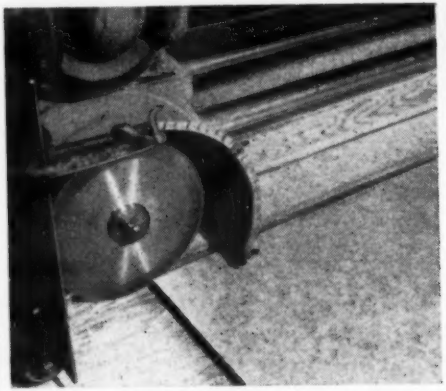
Positioning plastic laminate, there's no worry about grain raising or checking with moisture-resistant Novoply.



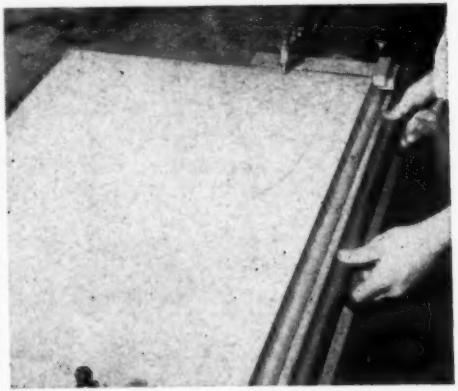
Sandwiches of Novoply and Micarta® plastic are squeezed in cold press. Novoply requires no crossbanding of any kind.



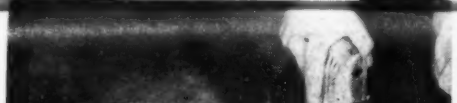
Double routing saw bites quickly through easy-to-work Novoply. This is first step in making cove



See how cleanly the groove is made on this saw jig. Novoply is a natural for faster edge molding, too.



Pipe bends plastic over cylindrical heating elements to make angle for cove. Strong Novoply needs no "kid glove" treatment.



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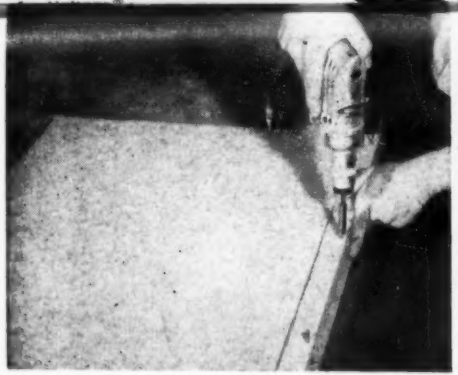

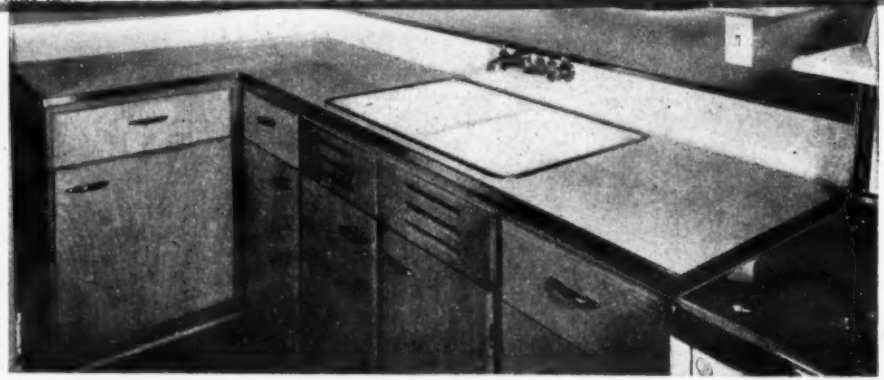

Power screwdriver attachment on drill helps fasten cove to Novoply edges. Novoply holds screws and nails extra-tight.

How's that for a beautiful top! Extremely flat surface of Novoply is your assurance of the absolute minimum in core photographing. This Micarta Unitop with Novoply core is tops in kitchen sinks.

See why NOVOPLY is a superior core for high-pressure laminates

General Kitchen Equipment Company, Inc. uses the superior qualities of Novoply to make kitchen sink tops at their Weehawken, N. J. plant. Here's *why* they chose Novoply:

Flat, dimensionally stable Novoply never requires crossbanding, has no hot spots or valleys, is good both sides, has no grain to raise, doesn't warp, works easily, is mechanically strong, uses less glue for good bond, is stabilized at "just right" moisture content for laminating. And—famous Weldwood quality control assures same characteristics *always!*

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by Weldwood®

United States Plywood Corporation

World's Largest Plywood Organization — 82 Distributing Units in Principal Cities

Specifications: Thickness: ¾"; wide assortment of stock sizes from 18" x 72" up to 48" x 120" including 30" widths, also cut-to-size for volume users from panels 6' x 12' and 4' x 16'. Available in ⅜" thickness, sizes 48" x 192", 48" x 96".

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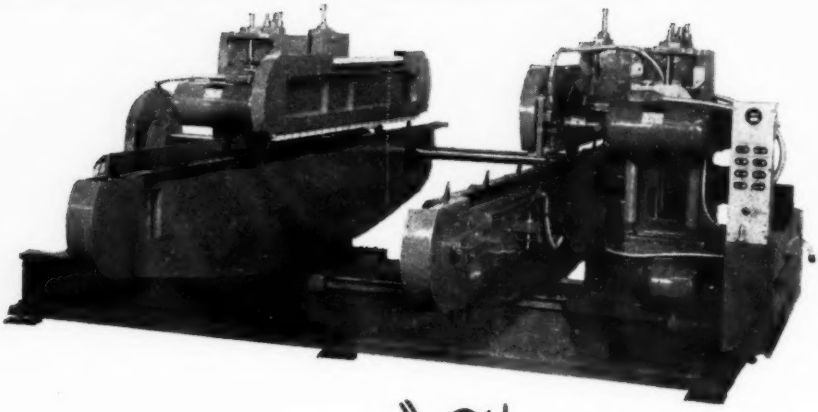

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Equipped with two 5 HP trim saw motors, four 3 HP tenon unit motors and two 5 HP cope motors. Plain or jump dado arbor can be mounted in place of the tenon units. Complete details on request.

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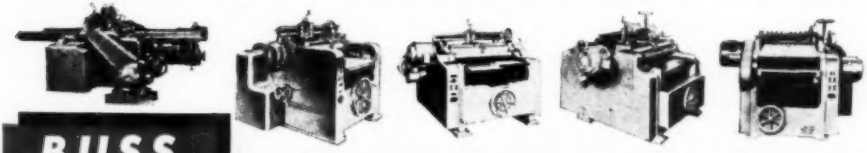
WILL GIVE YOU FINER FINISH *and* CLOSER TOLERANCE *than any other cabinet surfacers!*

. . . and this is no exaggeration, as anyone who really knows planing can readily understand when he reviews these facts: Incorporated in BUSS planers are a great many patented semi-automatic controls, found in no other cabinet surfacers, which permit the average operator to quickly obtain the settings required for fine finish planing — *with an exactitude and precision which is practically impossible to obtain without them.* These features include instant micrometer control of the Pressure Bar, Infeed and Outfeed rolls; semi-automatic setting of Infeed, Outfeed rolls and Pressure Bar. One-piece grinding rails, hand-scraped table wedges, center tables and pressure bars ground to a fraction of a thousandth of an inch and extra weight wherever it will contribute to added precision are among the dozens of other basic construction superiorities. which further guarantee the greatest possible accuracy and finest finish planing. And to make doubly sure that the BUSS planer you buy will do exactly that, each and every planer produced is subjected to an exhaustive running test in which it must plane to within .002" before it passes inspection. On the basis of FACTS and sound comparison BUSS is bound to be your choice, too. Write for descriptive bulletins.

THERE'S A BUSS PLANER TO EXACTLY SUIT YOUR NEEDS



BUSS
SINCE 1862
MACHINE WORKS

PLANER SPECIALISTS EXCLUSIVELY

234 EIGHTH STREET • HOLLAND, MICHIGAN

Balance

IS ESSENTIAL
in QUALITY high-speed production

Diehl
cutterheads are balanced!

Because every knife on a cutterhead is subjected to hundreds of pounds of centrifugal pull at *high speed,* balance *is* essential to quality production!

That's why Diehl Cutterheads have won top preference in the woodworking industry—for they *are balanced* . . . both statically and dynamically . . . on the finest dynetric balancer obtainable. And Diehl Cutterheads are built *to hold the edge and stand the wear* of high speed production—helping to insure quality!

Most sizes in Round, Square, Clamp T Slot and Vise Grip Heads are carried in stock . . . but Diehl is especially equipped to design and build special heads and cutters to solve unusual problems. Diehl's Engineering Department is always at your service.

To insure perfect balance and longer life, always specify Diehl Cutterheads. Contact your Exclusive Diehl Representative or the factory. Ask for Condensed Cutterhead Catalog—Bulletin No. 452.

Standard of Comparison in the Woodworking Industry

CUTTER DIVISION

THE G. M. Diehl MACHINE WORKS, INC.

WABASH, INDIANA • U. S. A.

Obsolescence

The Editor's Page

One of the outstanding talks given during the recent Chicago Market concerned "obsolescence." There is a full description of the word and its meaning to our industry in the article on the Market, page 63. The term needs to be used. Maybe we'll have come into the golden era when we have convinced all of our old and new customers that it is as far behind the times to rock in a twenty-year old chair as it is to ride in a ten-year old car.

Sure, this is good selling technique. We hope the furniture manufacturer and retail store can get together to put over a campaign with this theme. But the word has a further meaning for us in our industry.

Take time out for a stroll through your own manufacturing operation. Does the word apply? How about that machine that is often down for repairs. Who of your workers is handicapped by lack of equipment?

Next, take a look at your advertising program. Are you doing enough? Are you reaching the right people with the best kind of advertising message?

Why not earmark a good share of your profits for some replacements in your own plant?

There are some very encouraging trends in the next five years. We need to be ready and know how to take the best advantage of them. A walk through the plant, after hours so concentration is undisturbed, may do a lot toward helping you see your place in the future of the woodworking industry.

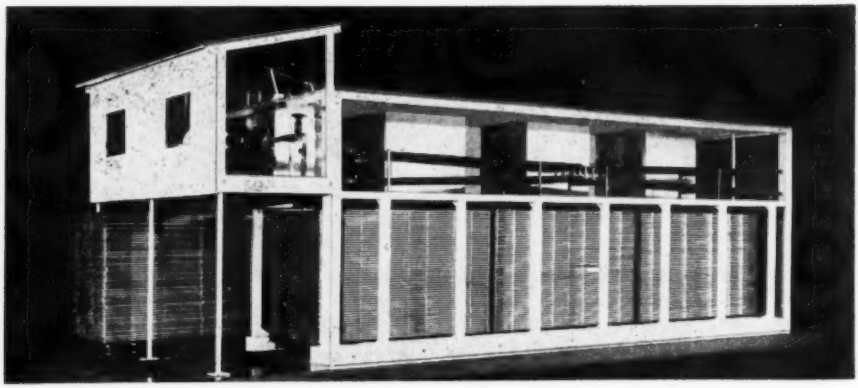
More than a million and a half new homes will be started this year. The standard of living is constantly mounting higher. The future looks good for all industry which ties in with the American home.

But markets do not exist for the asking. They must be sought out, appraised and then sold. Competition is keen and will grow.

In the words of Charles Coolidge Parlin, remember that you are "selling a parade, not a standing army." We must continue to manufacture what our customers want, in the materials and styles they want, at the prices they will pay. This takes planning, timing, proper pricing, redesigning products, new products and better products.

A tour through your plant, looking at it through the eyes of an employee, would be a good place to begin thinking about this wonderful future and a fine start toward seeing that the "John Doe Co." receives its share of Mr. Public's money for quality goods.

E. McDaniel
Editor



Why We Believe In The Longitudinal-Shaft Kiln—

Moore Engineers developed and have been granted patents on both the longitudinal-shaft kiln and the cross-shaft kiln. Experience has proved the longitudinal-shaft kiln superior, having these undeniably greater advantages:

★ Faster, more uniform circulation through each sticker course (it's the air across the lumber that does the drying)

★ More cubic feet of air per H.P. is produced by the large multi-blade Moore Fans, turning at relatively slow speed

★ One motor and drive *outside* kiln operate *entire* fan system *(electric motors and wiring should not be subjected to kiln conditions)*

★ All fans turn at identical speed, delivering identical volume of circulation

Over 70% of all the kiln-dried lumber produced in this country is seasoned with Moore Cross-Circulation Kilns—Let this record be your guide.

MOORE DRY KILN COMPANY

Oldest and Largest Manufacturers of Dry Kilns and Veneer Dryers

JACKSONVILLE FLORIDA | BRAMPTON, ONT. CANADA | VANCOUVER, B. C. CANADA | NORTH PORTLAND OREGON

Comments from THE NATION'S CAPITAL

By Arnold Kruckman
Washington Correspondent

On June 2, the U.S. Tariff Commission issued its report and recommendations in regard to the hearings that have been held since last September to determine whether any action was justified in connection with the tariff on the imports of hardwood plywood. The formal decision, contained in the finding and conclusion of the Commission, is as follows: "On the basis of its investigation, including a hearing, the Tariff Commission finds that hardwood plywood (except Spanish cedar plywood) provided for in Paragraph 405 of the Tariff Act of 1930, is not being imported in such increased quantities, actual or relative, as to cause or threaten serious injury to the domestic industries producing like or directly competitive products. Accordingly, in the judgment of the Commission, no sufficient reason exists for a recommendation to the President under the provisions of Section 7 of the Trade Agreements Extension Act of 1951, as ammended." (Spanish cedar plywood which is still dutiable at the rate of 40% ad valorum is not the subject of a trade-agreement tariff concession and, accordingly, was excluded from this investigation.)

"Up to 1954, the domestic hardwood-plywood industry has been experiencing a rapid and more-or-less continuous expansion that attained peak levels in 1951-53; this expansion occurred at the same time that imports were rapidly increasing. Up to that time, therefore, little evidence could have been adduced to justify a finding that increased imports, actual or relative, were causing or threatening serious injury to the domestic industry. In the view of the Commission, developments in the industry since 1953 have not been such as to justify (a finding of serious injury). It is true that the condition of the industry deteriorated to some extent in 1953 and in 1954, as evidenced by declines in production and employment and in the

earnings of both workers and investors in the industry. Nevertheless, production in 1954 remained higher than in any other post-war year except the peak years 1951-53, and for the industry as a whole, even the year 1954 was not an unprofitable year. It is quite clear causes other than increased imports—i.e., causes largely associated with general business recession that occurred during this period—were important factors in the regression that took place in this industry and that in more recent months the business trend has been upward.

Despite recent reverses, the domestic industry is currently operating on a greatly expanded basis. In view of the foregoing facts and considerations, the Commission is of the opinion that the domestic industry producing ordinary hardwood plywood is not being seriously injured or threatened with serious injury as a consequence of increased imports."

Copies of the report may be obtained by request to the U.S. Tariff Commission, 8th and E Streets, N.W., Washington 25, D.C.

Senator Sparkman (D., Ala.) recently urged the Senate to ease restrictions on Japanese exports to Communist China. The U.S. Department of Commerce Trade Mission, during its recent visit to Japan, promised Japanese business men in the seven principal cities of that country, to urge lower tariffs for freer trade upon their return to the United States, and elimination of U.S. requirement that all shipments must be made on American ships.

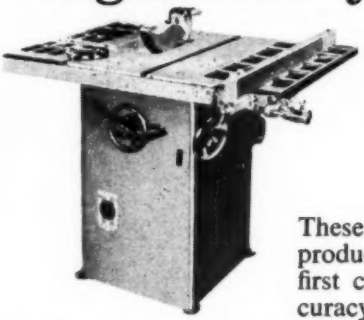
A big thing in the news that will come out of Congress in June, is the bill in the House for consideration and debate, which should be enacted at least early in July, if not before. This Act was passed by the Senate early in June and was the subject of a battle royal in the Banking and Currency Committee of the House for weeks before it finally found its way onto the Floor.

It provides the Federal Government shall supply a gross of $7.400 billion in cash and credit underwriting for various types of building; and shall create an independent Home Loan Bank Board, bringing together all Federal cash and credit facilities, under one concentrated control. The new independent Home Loan Bank, when established, will have reserves accumulated since 1932, in various Agencies, such as these in the Housing and Home Finance Agency, which includes the Federal Housing Administration, the Federal Savings and Loan Insurance Corporation, the Public Housing Administration, as well as a number that are not in this colossal building finance group.

All these Government units are to come under direction and administration of the membership which is to be composed of private banking and financial units, the whole almost identical in character and operation with the Federal Reserve Bank System. It is pointed out in the various debates in the Congress that the Federal Reserve System was credited with over $26 billion in reserves when it came into existence; and that the Home Loan Bank Board reserves will substantially exceed this total.

The new 1955 Housing Act, in essence, involves practically all Federal institutions concerned with home building; with the

These **NEW** Walker-Turner "Light-Heavyweights" give you



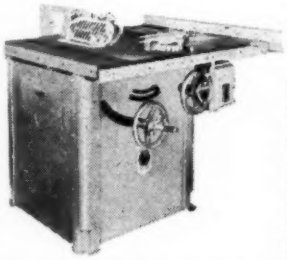
BIG MACHINE PERFORMANCE at LOWER COST

These rugged new saws slice right through your production costs . . . start earning their way the first cut you make. Here's performance and accuracy you'd normally find only in much heavier, more expensive machines.

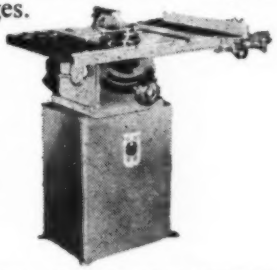
Faster, smoother production cutting is built right into these new Walker-Turners! Motor mounting and arbor *tilt as a unit.* Guard and splitter are always lined up with the blade for protection at any angle. Saw arbors mounted on precision ball bearings on all models.

Ask your Walker-Turner Distributor for complete specification sheet, and a demonstration of what these new saws will do for *you.* He's there to help you. You'll find him listed under "Tools" in your phone book's Yellow Pages.

No. 2221 — 10" Tilting Arbor Saw — Capacity: 3⅛" with 10" blade; 2⅛" at 45°; with 6" dado, 1⅛". Speed: 3800 rpm. Table: 32½" deep x 32" wide; 32½" x 45¾" with extensions. With 10" combination blade, extension tables, miter gauge, guard, splitter, motor pulley and belt (without motor) $297.00.



No. 2450 — 14" Tilting Arbor Saw — Capacity: 5" with 14" blade, 3½" at 45°; with 8" dado, 2". Speed: 3450 rpm. Table: 38¾" deep x 48" wide with extension. With 14" combination blade, extension table, miter gauge, splitter, guard, including 5 hp 220/440 volt 60 cycle 3-phase motor, with push button station. $946.50.



No. 2121 — 8" Tilting Arbor Saw — Capacity: 2⅝" with 8" blade, 1½" at 45°; with 6" dado, 1⅝". Spindle speed: 4000 rpm. Table: 23" deep, 19" wide; 23" x 37" with extensions. With 8" blade, extension tables, miter gauge, guard, splitter, belt, motor pulley and sub base (without motor) $192.00.

walker-Turner

WALKER-TURNER

• DIVISION •

KEARNEY AND TRECKER CORPORATION

PLAINFIELD, N. J.

DRILL PRESSES — Hand and Power Feed • RADIAL DRILLS
Wood and Metal Cutting BAND SAWS • TILTING ARBOR SAWS
RADIAL SAWS • JIG SAWS • LATHES • SPINDLE SHAPERS • JOINTERS
BELT AND DISC SURFACERS • FLEXIBLE-SHAFT MACHINES

equipment and installations that go into new homes and the rehabilitation of existing homes for which the Federal Government will supply cash or credit; and for other types of urban and rural structures for which credit and cash may be supplied in various ways by the National Government.

This is written before the Act, as enacted by the Senate, was passed by the House, and approved by the President. There seemed little doubt that it would be made into law as outlined. Before the Senate Act actually becomes law there may be some radical changes which no one has yet even considered in their remotest dreams; the greatest likelihood is, if there are such shifts in legislative action, that they will mean more funds and more authority to spend more money and to give more credit for an infinite number of building operations that were not originally contemplated.

As the program now is planned, without exception, every kind and class of building operations supported by Government cash or credit, will expand in volume! Far more financial resources are to be made available than even by the terms of the Act passed by the Senate. For instance, low rental dwelling space is increased from 35,000 units a year over two years, to 135,000 units a year for four years—a total of 540,000 units over all. Somewhere between 100,000 and 500,000 military housing units are to be provided as quickly as possible by the expenditure of an absolute minimum of $1.350 billion for a program.

The Housing Act of 1955 was thus reported by the Senate Banking and Currency Committee: "The bill is a comprehensive measure designed to extend and clarify laws relating to housing to assist our people to acquire good homes, and to assist our communities to develop wholesome neighborhoods. In addition to general housing amendments, the bill provides programs in the areas of public facilities loans, college housing, Armed Services housing, smoke elimination, air pollution prevention, and farm housing."

The Federal Housing Bulletin of May, 1955, reports the number of new private dwelling units started in 1955 has been at a "seasonally adjusted annual rate close to 1.400 million units." Another Government statement, in the Federal Reserve Bulletin, declares the increased volume of housing starts in 1955, compared with 1954, reflects a doubling in the number of units started under arrangements for Veterans' Administration guaranty.

FHA considers housing demands generally strong in practically all markets. The discussions in Congress and among Government authorities usually lead the visitor to conclude that there will be an enormous consumption of wood products in building houses, and in supplying the things that will be needed in the new or expanded homes—either as installations and equipment that are part of a building operation, or the furniture and other similar furnishings. FHA made a special survey and found evidence of very few housing surpluses. Thus far the FHA Administrator has restricted commitments in only 18 localities.

Excellently Designed Rafters Laminated with Penacolite® Adhesives Give Iowa Farmer a STRONGER BARN

Anthony J. Bonert
Dyersville, Iowa

Mr. Anthony J. Bonert of Dyersville, Iowa, has a new barn, and he should have it for a long time. Penacolite Resorcinol Adhesives were used by Super Structures, Inc., of Albert Lea, Minnesota, to bond the laminations which form each rafter into one continuous piece from base to ridge. Due to lamination, the rafters have greater structural strength and wind resistance. And the Penacolite Resorcinol Adhesive bonds remain as strong as the wood they join through all types of weather conditions and temperature changes.

Because they are cured through an irreversible chemical action, "Penacolite" bonds *stay* strong indefinitely. They are completely waterproof and cannot be weakened by rain, humidity, extreme heat or cold. Furthermore, Penacolite Adhesives are easy to use, and curing time is just a few hours at room temperature, or only a few minutes under accelerated heat.

Koppers Adhesives have wide use in the construction of many types of farm buildings—barns, corn cribs, machinery sheds and others. Write for our free illustrated booklet describing their properties and many applications.

KOPPERS COMPANY, INC.

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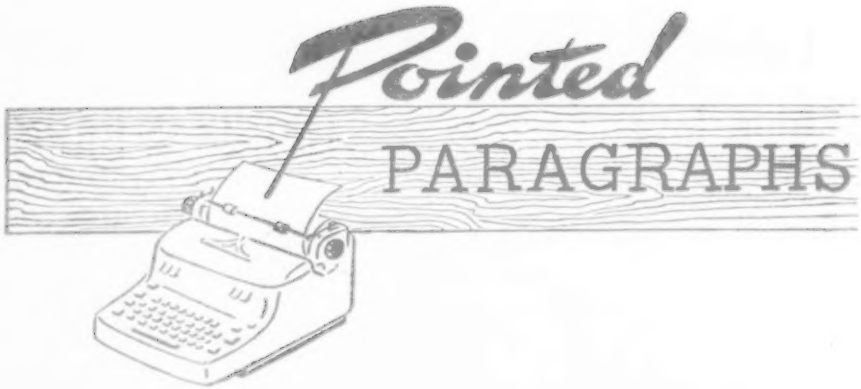
PENACOLITE® RESORCINOL ADHESIVES

The original waterproof, room-temperature-setting adhesives



More than 500 attended the F.P.R.S. Annual Meeting on the West Coast in June. One of the highlights was the presentation by our president, R. C. Van Kampen, of WOOD WORKING DIGEST Award of Merit Citations to 11 organizations. Here are the winners in our Second Annual Contest: Architectural Woodwork Institute, The Borden Company, Hardwood Dimension Manufacturers Association, West Coast Lumbermen's Association, State University of New York, Western Red Cedar Lumber Association, Wood Office Furniture Institute, Dependable Machine Co., Elliott Bay Lumber Co., Mississippi Products Co. and Michigan College of Mining & Technology.

Plan to enter the Third Annual Award of Merit Contest sponsored by WOOD WORKING DIGEST each year to recognize firms and organizations who are doing an effective job of promoting wood in preference to other materials. Watch for details in a later issue or write directly to the editor for an entry blank when they are available.

June issue of our magazine featured the Douglas Fir Plywood industry. Many of our readers have written to say how much they enjoyed this number. The Douglas Fir Plywood Association's Golden Jubilee will long be remembered. This event, taking place the middle of June, attracted every outstanding fir plywood manufacturer in the industry—registration was over 1200. During the event, the first panel of plywood manufactured 50 years ago, was dedicated as a permanent memorial.

According to several manufacturers, wood cabinets for kitchens and bathrooms are definitely making a comeback. Prophesied increase in price for steel cabinets will be of real aid to this group. The increasingly popularity of color in the kitchen is partially responsible for this.

Save Time Save Money

use

DUO-FAST automatic TACKERS

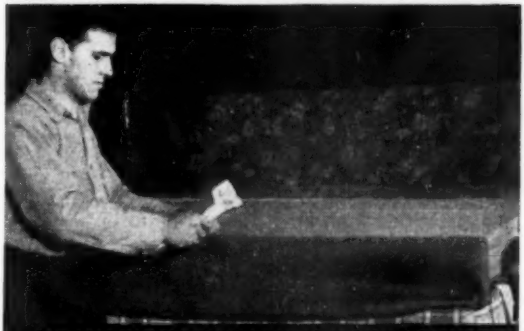
DUO-FAST AIR TACKERS cut production costs on case backs, drawer guides, and numerous other jobs.

MORE WORK, in less time, using fewer workers—that's the story on Duo-Fast Automatic Tackers and Staplers.

WIDELY USED in cabinet and woodwork shops, furniture plants, sash and millwork factories, toy makers, for a wide variety of fastening jobs.

A COMPLETE LINE OF AIR TACKERS, HAMMER TACKERS, GUN TACKERS, STRIKE TACKERS, and AIR STAPLERS, including the model to save you time and money.

DUO-FAST GUARANTEE assures you of free service on Duo-Fast machines. An important money-saving feature.

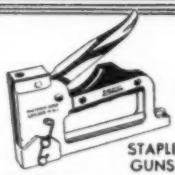


DUO-FAST HAMMER TACKERS speed and simplify many tacking jobs. One-hand operation.

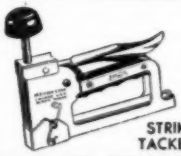
50 Sales & Service Offices in Principal Cities

WRITE TODAY FOR YOUR COPY OF THE DUO-FAST CATALOG & PROFITABLE SUGGESTIONS

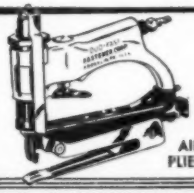
The *right* machine for each job is important. You'll find the *right* one in the **DUO-FAST LINE**



STAPLE GUNS



STRIKE TACKERS



AIR PLIERS

FASTENER CORPORATION

858 Fletcher Street • Chicago 14, Illinois

Chicago spring and fall markets may be here to stay. May showing unveiled a number of new and well-priced lines. This issue gives a report on the first-day of the summer market.

Walnut, cherry and oak were prominent among woods shown at the market. Prices were stable and light finishes continue to be popular.

Ten states accounted for over 50% of the total furniture business in 1954 in all types of furniture. Percentage ranged from 53.6% on dining room furniture to a high of 65.6% on infants' and juvenile furniture. Complete study is available from the National Association of Furniture Manufacturers, Chicago.

A new weatherproof plywood panel, phenolic resin and cellulose fiber surfaced, is a versatile medium for both residential and commercial construction. This material, of a light buff color, is being offered by U. S. Plywood, and has been called Duraply.

Some 70,000 churches and synagogues will be constructed or substantially altered in the United States during the next ten years. About 12,500 parish houses, Sunday school buildings and related buildings will go up. This is based on Dodge Reports which indicated continued good business.

Congratulations to the 22 N.A.F.M. members who have perfect safety records next month. We shall publish news about the winner. Incidentally, how about safety in your plant? Read this month's feature for some new ideas.

April orders for new woodworking machinery and equipment were up 92% over orders during April, 1954, according to the Woodworking Machinery Manufacturers' Association. These are figures covering new orders and shipments of industrial woodworking machinery and do not include any homeworkshop equipment.

Current forest fire season has started out to be the worst in many years. Post brochures and posters about your own plant so that none of us is guilty of adding to this chronic problem.

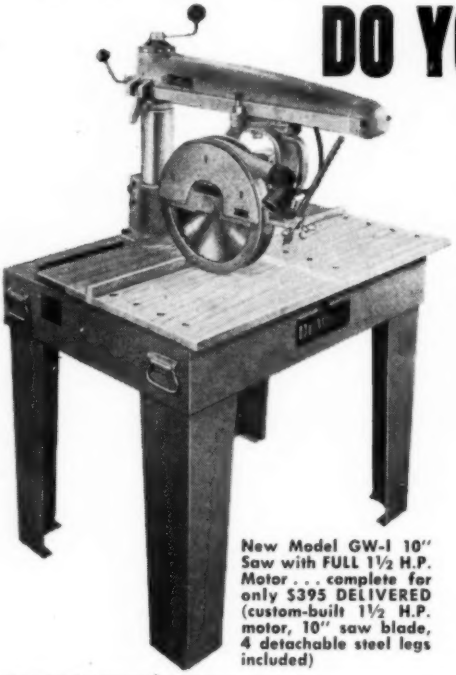
Southern hardwood lumbermen do not want a higher minimum wage. Speaking before the House Labor Committee, spokesmen stressed that this higher wage would create unemployment and reduce take-home pay of many other workers.

This issue carries the first installment of a series on wood machining. This is reference material the industry has long asked to have. Let us hear from you after you have read it.

Yellow poplar is the most popular native wood used by southern furniture factories. Oak is next and then gum. Honduras mahogany is the most popular foreign wood in use in the south. African mahogany is next.

You may have spent enough to pay for an AMF De Walt machine...but

DO YOU OWN ONE?



New Model GW-I 10" Saw with FULL 1½ H.P. Motor . . . complete for only $395 DELIVERED (custom-built 1½ H.P. motor, 10" saw blade, 4 detachable steel legs included)

Even if you've invested as little as $239 in shop equipment you may not be enjoying the profit-making benefits of a DeWalt®. We invite you to compare your present equipment and shop methods with these AMF De Walt features and operating advantages:

- One low-cost machine that does ALL the work of a swing saw, straight line cut-off and miter saw, table-type rip saw, dado machine, shaper plus many others.
- Savings of up to 60% or more in capital equipment investment alone.
- 75% savings in floor space alone! AMF DeWalt can be placed against any shop wall—instead of in the center of the shop.

Find out about ALL of AMF DeWalt's many advantages—send today for free new idea book for industry. MAIL COUPON TODAY!

LOOK AT THESE OTHER AMF DEWALT ADVANTAGES!

- Top-side Cutting for Safest Cutting
- 90% Savings in Layout and Marking Time
- Reduces Waste—Salvages More Lumber
- One-minute Change-over, No Shut-down Worries
- Reduced Fatigue, Greatest Operating Ease and Safety
- Modern Straight-line Materials Handling

Another AMF Product

DE WALT POWER TOOLS

Lancaster, Penna.

SEND FOR *FREE* NEW IDEA BOOK ON INDUSTRY! 16 pages packed with illustrations. Shows you dozens of ways to cut costs on cutting jobs, time-motion study.

AMF DE WALT, Dept. WD-55-7, Lancaster, Pa.

Please send me your new idea book for industry.

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ADDRESS_____

CITY_____ STATE_____

with these 2 fine surfacers

with these 2 fine surfacers you can fill any imperfection from a hammermark to a knothole

With waterproof-weatherproof DURATITE Surfacing Putty and Wood Dough you can do a better job every time. These are the finest products on the market for filling dents, scratches or holes... in wood, plastic and other commonly used materials.

FOR SMALL CAVITIES

Use Surfacing Putty for all small cavities. It is extremely fine textured and can be sanded to mirror smoothness. Edges can be sanded to absolute perfection.

FOR LARGE CAVITIES

Use Wood Dough for all large cavities. Fine textured, rapid drying, it is quickly ready for sanding, sawing, milling or carving.

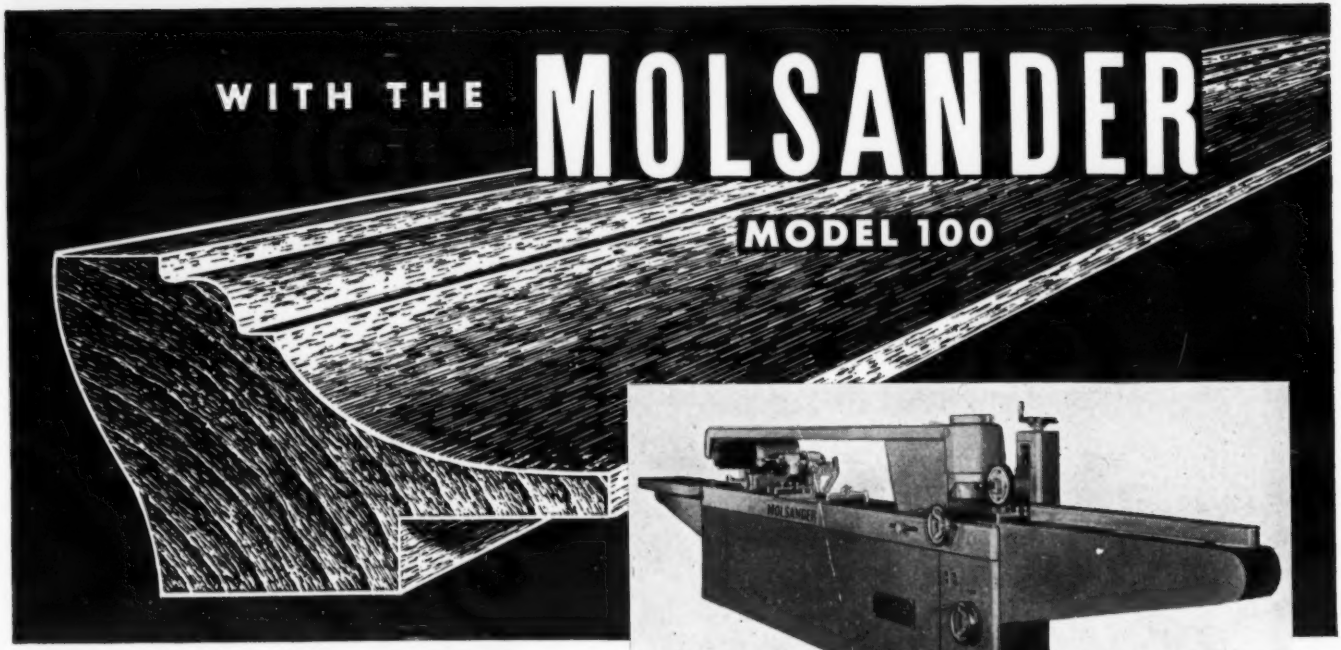
8 TRUE COLORS AND 6 SIZES

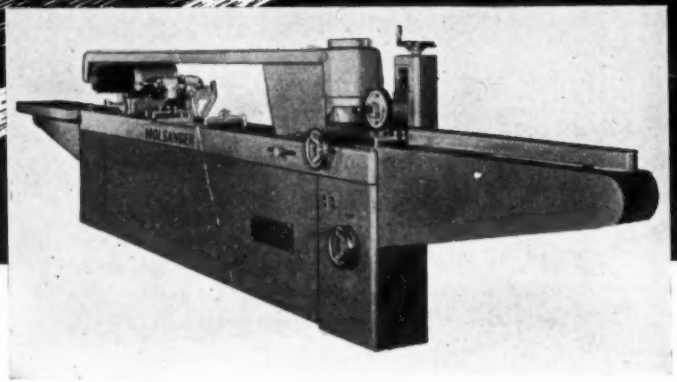
Both Surfacing Putty and Wood Dough are now available in 8 true colors for easier wood matching and in 6 sizes to fit any need. Both take all commonly used stains.

AT LEADING STORES

You will find these DURATITE products at all leading hardware, paint, lumber and marine supply stores. Ask for them by the name DURATITE. You'll be glad you insisted.

WEBB PRODUCTS CO. • ESTABLISHED 1923
SAN BERNARDINO, CALIF. AND NORCROSS, GEORGIA





ONE PASS DOES IT!

That's right, with the Molsander, many mouldings require *only* one pass through the

Many other outstanding features of the Molsander include:

- Replaceable rubber-tired upper and lower feed rolls — Protect stock.
- Equipped with power driven rubber covered endless belt — Assures constant feeding.

rolls — Protect stock.

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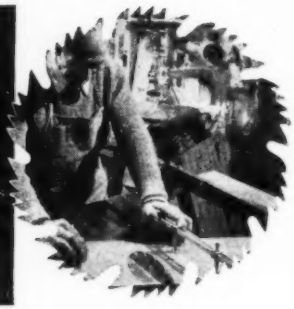

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Fundamentals of WOOD MACHINING

By Carl Chekouras

TO BETTER understand wood machining it is necessary to first understand wood. What is it? We have long spoken of it as a by-product of the ordinary tree and take for granted that cutting the tree and sawing the log into boards creates usable lumber for every day use. That may have been true in the early stages of lumbering, but today the science begins even before the tree is planted.

If four identical seeds, of a well known species, were planted in four different parts of the United States, we would have four different kinds of wood. There is a certain amount of oak being grown throughout the country, but the wood produced differs according to habitat. For instance, southern oak has proved to be very serviceable for oak floors. Much of the beautiful new oak furniture has been made from trees grown in the mountains of the Appalachian regions. In the northern part of the country, although much of the oak can be used in flooring, it is best suited for railroad ties and timbers. Oak from the southwest would have still different characteristics and utilizations. In all cases moisture, sunshine and altitude influence the development of the tree.

Space will not permit a discussion of further variations, so let us consider wood as a basic material. We have chosen yellow pine for use in our diagrams. The structure of the material, why there is grain and the importance of the relationship of grain to the machining of wood will be illustrated.

Figure 1 shows a quarter section of a pine log and emphasizes its characteristics. There are small spots showing mineral deposits which became embedded in the wood through winds or carried there by animals. It is erroneous to believe that mineral deposits will be carried from the ground into the tree. Figure 3 shows the complex system of wood fibres that would prohibit minerals being carried from the soil.

Figures 1 and 2 illustrate the annular rings which will be referred to hereafter as grain. The seasons will determine the density of the wood and from one annular ring to the next it is easy to determine the amount of moisture, sunshine and warmth that prevailed in the locality where the tree was grown. Later we shall see how these prevailing atmospheric conditions influence wood machining.

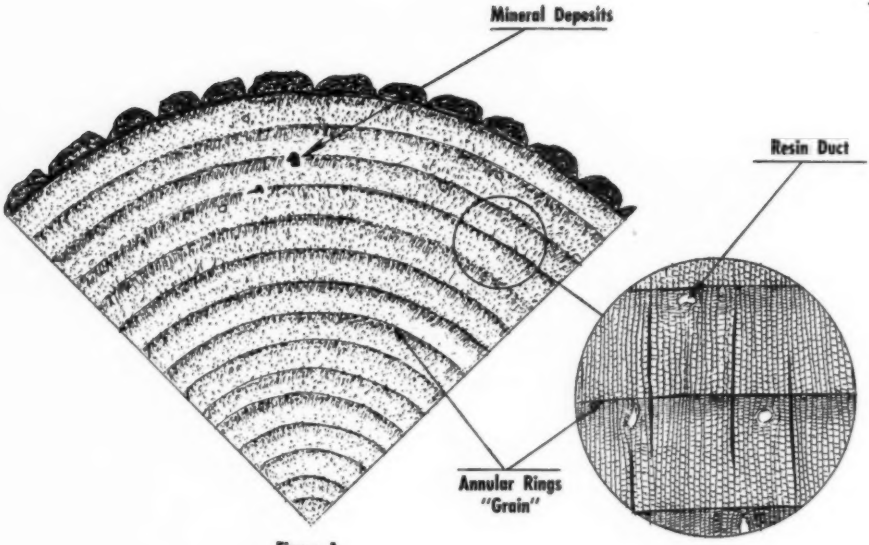


Figure 1.

Figure 2.

Figure 1. Sketch of cross section of a quarter of yellow pine.
Figure 2. Enlargement of section of yellow pine. This is the area circled in Figure 1.

Structure Related to Machinability

Scientific structure is different for each species, but wood structure is somewhat similar in relation to its machinability. It is true that it would be a mechanical advantage to have the wood machining tools designed to perform their best when working a particular species. Standardization of tools and equipment, however, makes such variation impossible.

To simplify the explanation of wood structure, think of wood as an amount of rope compressed into a long board. Each of the fibres must be individually severed. A native harvesting bamboo or rattan develops a skill so that one swing of his machete cuts the stock clean. A very sharp edge is needed or the fibres of bamboo will be crushed rather than severed. Now consider the various methods of tree cutting and note the similarity.

The woodsman has an axe, in theory a knife, having an added handle to increase the force of blow by increasing leverage. The axe head also adds weight to increase the force of the blow. The sawyer has a blade of steel with a series of teeth so filed that each performs a singular task of severing the fibres. The edges in all cases must be kept sharp or the fibre cannot be severed cleanly.

THEORY OF WOOD MACHINING

The evolution of wood cutting machines has been great but the process is not so evolved that the original method is lost. Although the original method of cutting wood with a metallic blade is a far cry from the modern chain saw, it is a fact that somewhere in the world the oldest methods are still in use.

Before going further into the theory it would be well to illustrate the average structure of wood and refer to its fea-

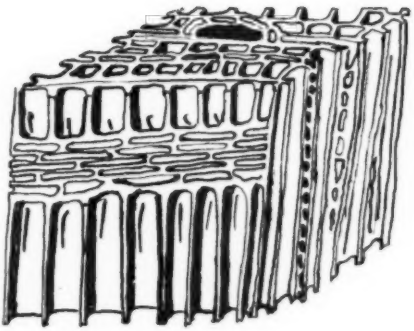


Figure 3.

Figure 3. Sketch of microscopic view section of yellow pine.

tures by common terms. The original state of wood after the tree has been felled could be called the first machining operation which changes the tree into a log. The logs are cut into functional lengths then the second step, cutting a portion of the periphery away, creates a flat surface upon which all future operations are dependent. As long as the wood has such characteristics as grain, it will be necessary to define the positions and to identify the features of the stock. Figure 6 is a view of a piece of machined wood.

In future references we shall identify the features of the stock by the nomenclature as illustrated in Figures 7, 8 and 9. Even when concerned with a square piece of stock, one can distinguish between face and edge grain. For instance, cut a board into strips then machine each strip on what appears to be the edge and it is still necessary to consider the grain in order to distinguish the features of each strip.

Pocket Knife Experiment

To illustrate the elementary theory of woodworking, a knife experiment will demonstrate the science of cutting. Take a piece of softwood and start to whittle it. You will notice that you first establish a cutting angle that is best suited to effectively remove the stock with the least effort.

Now turn the knife so that the cutting blade is nearly perpendicular to the surface being cut. You will now notice that the blade does not have a tendency to dig in and chip out but requires more power to perform the cut. This is the elementary theory of wood machining. The greater the angle or hook, the less required power, but the less desirable the finish.

We now consider cutting across grain. Hold the knife in an upright position and grasp it so that you can exert more power (Figure 12). Then draw

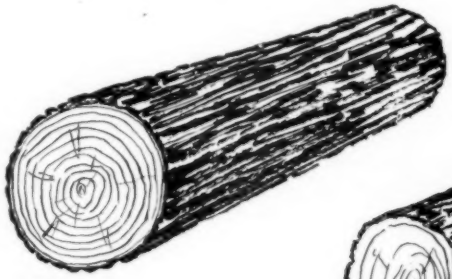


Figure 4.

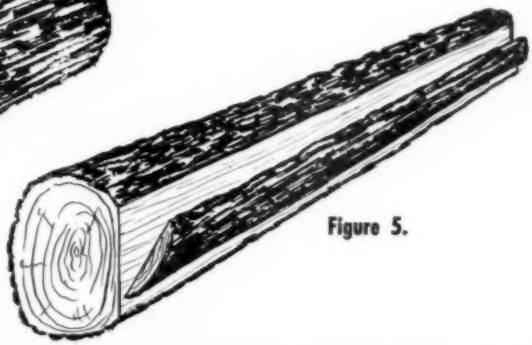


Figure 5.

Figure 4. First wood machining operation. *Figure 5. First step in producing lumber.*

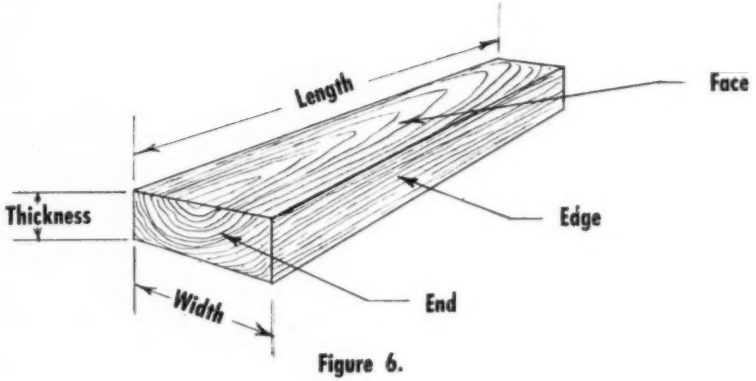
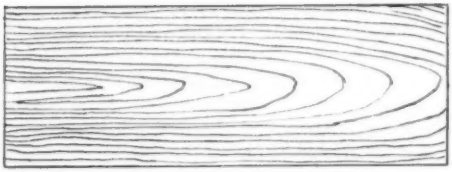
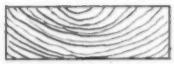


Figure 6.

Figure 7.



Face



End

Edge

Figure 8. Figure 9.

Figure 6. Nomenclature of a piece of wood.
Figure 7. Face of material showing "grain."
Figure 8. End of material shows annular rings.
Figure 9. Edge of material has the thinnest showing of grain.

the knife across the grain cutting a slight groove.

In figures 13 and 14 we have the principal of cross cutting. It would not be practical to tip the knife back (figure 14) as it would then tear up the surface grain. In all cases the grain has to be severed and the position in which the cutting edge approaches the fibres, plus the sharpness of the cutting edge, determines the quality of the finish. The cross cutting saw blade is a series of such knife points, each to perform the task of cutting a fibre or more.

TYPES OF MACHINE CUTS

The number of different cuts which can be made in wood is almost unbelievable.

Cross Cutting

There are five distinctive cross grain cuts, each distinguished by its end result. The original or first operation in wood machining is to cut a piece of stock to a desired length. Ordinarily

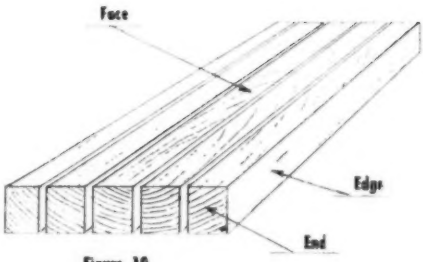


Figure 10.

Figure 10. Sticks produced by ripping or splitting.

this cut does not require a fine finish as there are future operations that will do this. The first cut, therefore, can be called a cutoff. This is accomplished by a cross cutting saw blade used on many different makes and types of machines. There are some machines that operate hydraulically, electrically or manually for this operation.

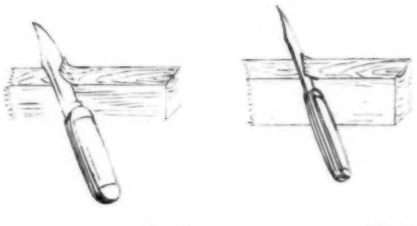


Figure 11. Figure 12.

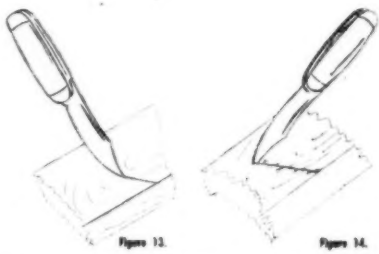


Figure 13. Figure 14.

Figure 11. A heavier shaving produced, but blade has a tendency to "dig in."
Figure 12. A lighter shaving such as produced by scraping.
Figure 13. Note smooth edges along cut.
Figure 14. The grain tears up along the cut.

Although the machines differ many ways in appearance they still have the same function to revolve a saw blade at a speed suitable to the diameter of the blade that will best cut the stock. It is here that we make a comparison to another type of cross cutting operation referred to as trimming.

Trimming. Although in the manufacture of lumber the machine that is ordinarily used to cut the lumber to length is referred to as a trimmer, it does not necessarily mean that this cut is the final cut. In the manufacture of dimension material for building purposes the trimmer is usually set to cut the stock to the exact desired length. In that case, it is the final cross cutting operation. If the stock is to be used for further manufacture, such as in the sash and door furniture industry, it is cut to a functional length and, with further manufacture, the stock has to be cut to a close fitting tolerance. This operation should be accomplished on a machine that is primarily designed for accurately cutting lumber.

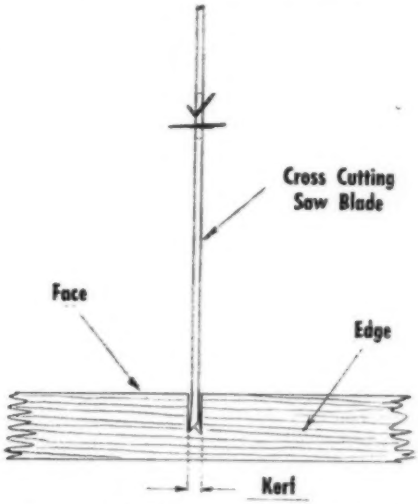


Figure 15. Sketch of a crosscut saw "in the cut."

Figure 16. Mitre cut using combination blade on table saw.

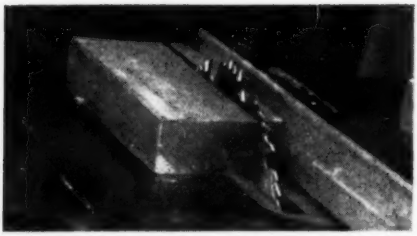


Figure 17. Ripping cut using combination saw blade.

Trimmer operations are frequently included along with operations performed by double end tenoners, end matchers, single end tenoners, combination multi-purpose machines and in many cases with the ordinary table type saw. The blade often used for trimming is similar to the cross cutting blade with the exception that it has finer teeth and is sometimes hollow ground to produce a fine finish.

Mitre cutting. Another cross cutting operation which can be included in the trimmer class is that of cutting a mitre. In the manufacture of picture frames the importance of a mitre cut cannot be minimized. The mitre cut, in this case, has to be made on a machine that will firmly hold the stock so that many parts can be made of the same size. The blades used for mitre cutting are of the cross cut type but require more teeth and a type of sharpening that will not allow the stock to chip out and leave defects in the finished product.

Figure 18. A bevel cut by sawing.

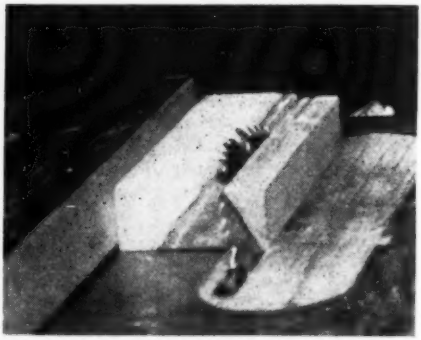


Figure 19. Cutting the second cut of a rabbet.

This is very noticeable in picture frame stock as the many different patterns must match up very accurately or the finished product will not be acceptable. In most instances a mitre cut is used on high grade work and requires the same care. There are, however, mitre cuts used in the construction of a house frame which do not require such accurate workmanship as does a frame mitre. These operations are usually performed on other machines than a mitering machine. For instance, the combination mitre and gaining cut such as used in rafter notching is invariably covered by future construction of the building and thus does not require such fine finish.

Dado or gainer cutting. Although the groove that is cut perpendicularly across

Figure 20. A plow cut made by a series of saw cuts.

the face of the grain can be made by a router, it is most commonly accomplished by either a cutterhead or an adjustable dado head. In any case, the cut made across the face of the grain is known as a gaining cut. The type of cutter employed for this work has fine cutting saw blades or spur teeth on the outer edges of the cutter so that the grain is severed with a minimum amount of chipping. The dimension is accurately maintained. Between the spur cutters or the smooth trimming saws there are a series of cutters or knives that remove the stock to the desired depth. The illustrations on saws and cutterheads will show the type of tools employed for this operation.

Ripping

There are two types of ripping. One occurs when the board is cut along the face grain in order to decrease the width of the stock. Here again there are many types of ripping determined by the end use of the material. It would be well to note here that the ripping operation is one of the greatest lumber wasting operations there is and much of this could be saved by careful planning in the cutting. Often the manufacturer tries to use a thinner kerf saw to control the amount of kerf removed and in so doing does not cut a straight line. This must be compensated for by leaving stock enough for the next operation to remove.

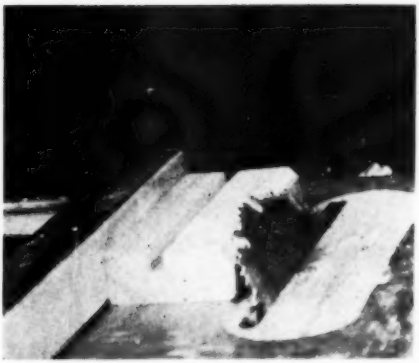


Figure 21. Cutting a chamfer.

If a slightly heavier saw were used the rough dimension could be decreased. There are more machines designed for ripping lumber than any other operation in the woodworking industry. Yet, this is an operation which requires more study than any other. This is obvious by the great demand for any new idea in rip saw blades. The industry is trying hard to find the easy way out, but invariably returns to the basic principles of rip sawing. Machines have been designed to rip stock at tremendous rates of feed but in most instances the blade used on the saw is not qualified for the maximum efficiency. In future explanation of saw blades further detail will be discussed concerning this important operation.

Bevel sawing. When a rip cut is made, not perpendicular to the surface of the stock, this cut is then known as a bevel. Oftentimes a bevel is confused with the cut known as a chamfer but each has its own distinguishing features. The bevel cut is a cut that produces a side not perpendicular to the surface but across the entire thickness of the stock. The chamfer cut produces an angle at a corner of the stock for the purpose of removing a sharp edge. If this same cut produces a radius on the corner of the stock it is then

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known as an ease. In the production of a bevel the same care must be taken as in producing a finished rip cut.

An added precaution should be observed because the bevel is usually a finish cut and in many instances does not require further machining. The ordinary rip saw is employed to produce the bevel by either tilting the arbor or the table of the machine. Most radial arm saws as well as hand electric saws are designed to produce a bevel cut. A common form of bevel is that which is used on regular beveled siding. This is accomplished by tilting the saw blade or the feed roller of a resaw. This type of bevel not being cut from the face of the stock, but from the edge of the stock is known as a resaw bevel.

Rabbet cut. A rabbet cut is an operation along the lineal edge of the stock that forms a recess for other fittings. Such an operation can be accomplished by cutting a groove in the edge of the stock and making the second cut in the face of the stock with the blade so set that the corner forms the corner of the rabbet cut.

Plow or groove. When a groove is cut in either the face grain or the edge grain of the stock running lengthwise it is identified as a plow cut. This operation creates a groove of a given width and dimension. When this cut is made in the edge grain of the stock it is known as a groove such as the tongue and groove on flooring. The plow cut can be accomplished on any saw qualified to do a ripping operation with the exception of the band rip saw. It can be accomplished on such molding machines as the sticker, molder, shaper, planer or matcher.

(To be continued.)

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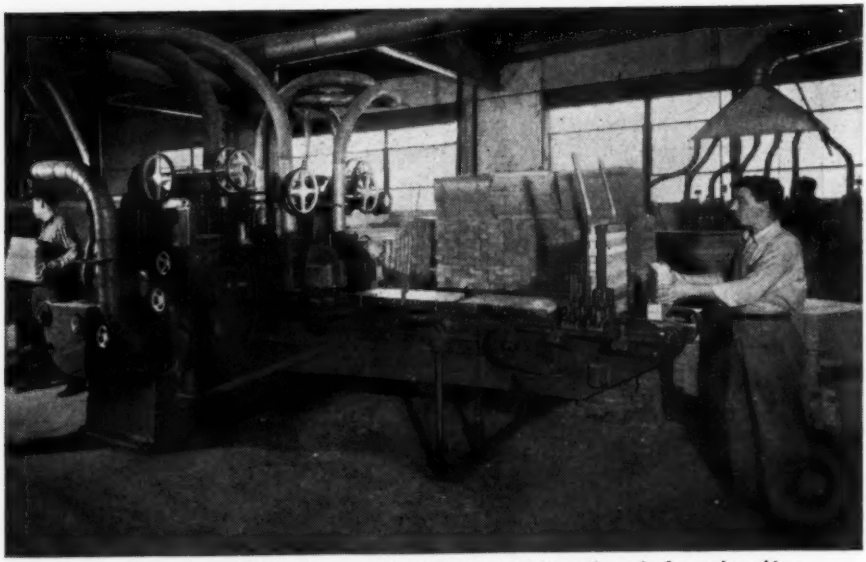

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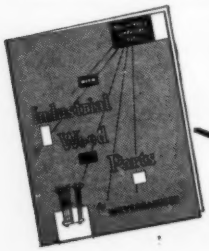

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the CHICAGO MARKET

By E. McDaniel

OPTIMISM surrounded one immediately upon entering the American Furniture Mart on the morning of June 21. Attendance could in no way compare with the crowds seen at the Winter Market, but it was evident that business was good and expected to stay that way.

General Larence H. Whiting, Mart president, says that business this year has surpassed 1954 by from 8 to 15%. "It is interesting," he said to the press, "that almost every report indicates that the public is spending its money for middle and upper-middle grades of home goods."

Home furnishings manufacturers have worked hard to furnish the goods and help persuade the public to spend their money in this way. There is still more work ahead if business is to continue good. Among other things, something must be done to help the profit side of the ledger. Costs have risen, but price adjustment has not followed. It is impossible to predict just what may or can be done. The public is currently sold on the need for good furniture. But a steep climb in prices would certainly cause this business to fall off. We need to continue to use the best methods of merchandising our goods to hold the markets we now have.

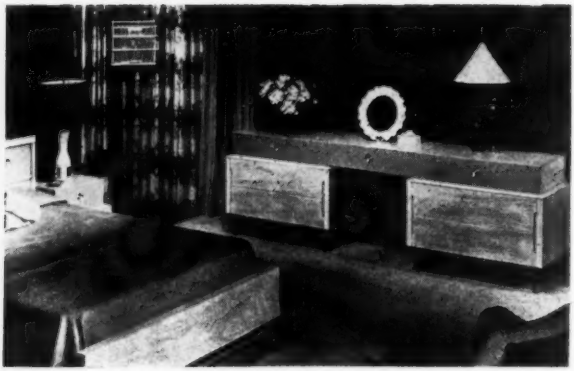
Obsolescence in the Furniture Industry

Two speakers stressed the need for continuing to reach the American home with a selling message. The first of these was Mrs. Mary Davis Gillies, an editor of "McCall's Magazine." She emphasized the fact that furniture which has outlived its day should be discarded fast for the good of the public morale. The industry holds a larger business potential now than ever before in this history of the country.

The industry, Mrs. Gillies said, has "better design than ever before in its history." The public, likewise, is avidly eager to stay home and enjoy the comforts of good living.

People have more money to spend than ever before, but the older generation has homes cluttered with outworn furniture and furnishings. That is the obsolescence the industry must attack. Not so, the newest crop of homemakers. They, like the rest of the nation, have become stay-at-homes willing to tinker on do-it-your elf projects, dig in the gardens, entertain around television and have families in homes they own themselves.

Mrs. Gillies scolded the leaders of the more than $15 billion industry for "picking only the windfalls instead of



Long, low and modern. The two-tone note is seen in the vanity which rides on two small decorative chests. Wood is mahogany in a variety of finishes and manufacturer is Basic-Witz.

reaching for the juicy apple ready to eat." She said:

"The 'brides' market, around which the industry is centered, is a windfall market. Fewer than 600,000 new households are being formed annually. Postwar home building is another windfall market," Mrs. Gillies said.

The vast almost untapped market the industry must center on is the "drab homes stretching from coast to coast" and the mixed-up homes which vacillate between modern and hand-me-downs.

"The army of families who can afford to discard their decrepit and dingy old furniture—suffering from obsolescence—and the increasing host of retired couples who are making a second start in life represent this lush apple dangling above the industry's head."

"Frequent change is an expression of the American economy and reflects the American delight in something new. It reflects the constantly improving status of the average family. It is compatible with out migratory character," she said. Mrs. Gillies recommended that the industry manufacturers, wholesalers, retailers, designers, etc., find out by fundamental research the "way people live, think, and spend their money."

Fight for Prosperity

Donald M. Hobart, vice-president and research director of the Curtis Publishing Co., speaking to the American Marketing Congress, said that the national population will jump to 176 million by 1960 and climb 30 million by 1975.

The marketing expert told leaders that the following facts will contribute to the industry's unprecedented prosperity if they will fight for it:

1. There are 47 million households today and 56 million anticipated in 10 years.

2. People have more money and want to spend it on their homes.

3. The public's changing habits such as indoor to outdoor living.

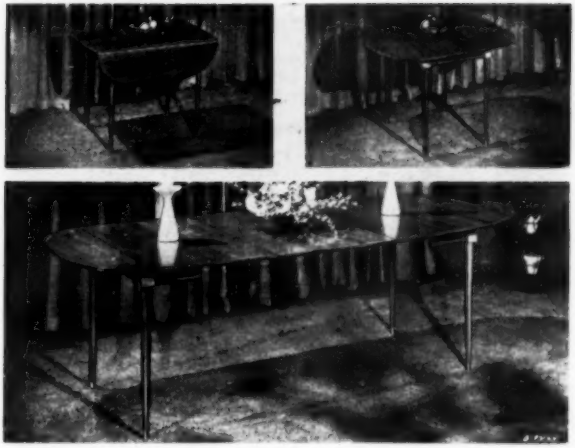
4. More leisure, more education, better taste, and more employed women who demand the latest in appliances.

5. Earlier marriages and larger families than a generation ago.

The key to this market, Hobart said, is to "manufacture customers just as the product he has for sale was manufactured."

He advised the industry to condition the public to think of furniture and furnishings, not as "postponables" but something they can not do without today.

At an earlier session in the American Furniture Mart Harold E. Green, executive editor of Printers' Ink, advertising trade magazine, said that many



This cherry table can serve as a console or a dining table 90" long. Note rounded contours. Manufacturer is Hickory Mfg. Co.

key national advertisers in the home furnishings field planned to spend from 10 to 20% more this fall and winter than they did in the same period last year.

Green, who has just completed a spot survey of 21 top advertisers in the field said that newspapers, consumer magazines and business papers will benefit most from these increased advertising dollars. He noted that there is increased interest in full color advertising and said that of 12 key companies using newspapers, 8 will increase their lineage, 2 will remain the same and 2 will use less. He estimated that 13 key companies in the home furnishings field participating in the survey will spend $12,000,000 this year in advertising and promotion, an over-all increase of more than 10%.

Heard at the Market

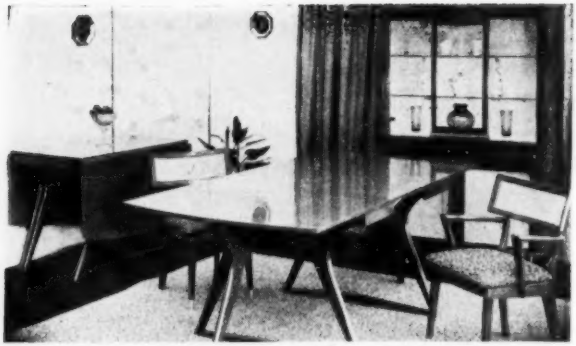
There is talk among steel kitchen cabinet manufacturers that there may be a 5 to 10% increase in prices. Good news for the wood cabinet manufacturer.

Prices were expected to remain firm during the Market.

There needs to be closer cooperation between manufacturer and retailer. Let the retail man know what future plans for new lines and discontinued models will be. Keep your salesmen and retailers informed about the raw materials used in your products—advantages of certain constructions and types of finishes.

Let's have faster deliveries of orders —or else a reasonable delivery date that the manufacturer is fairly certain of achieving.

Chairs were not made to flatten against the wall! Turned spindles tie in well with turned legs and stretchers. The steam bent curved back is solid birch. Manufacturer is Heywood-Wakefield.

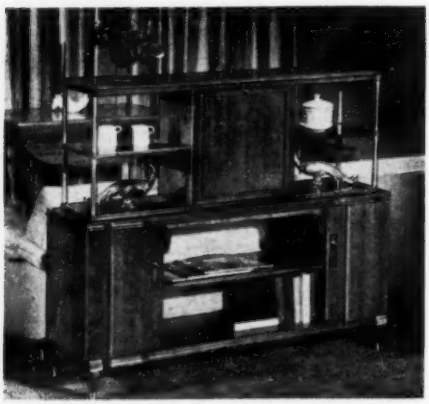


Meier & Pohlmann Furniture Co., featured 6-gate leg wing base drop leaf table. Table measures 42" x 26" when closed and extends to 84". Breakfront has an exclusive feature—concealed electric light in top interior floods light through glass shelves to provide a showcase for homemaker.

Let's see more advertising done by the manufacturer—particularly of national brand names. A tie-in like this should help the public, the retailer and reach right back to boost the manufacturer's profits too.

New Styles and New Finishes

There is a marked trend to rounded contours and corners. This appears currently in many of the higher priced lines. However, the middle and lower priced fields are sure to follow. In colors, beige, tan and cocoa are very popular. Brass finishes are slowly superseding the wrought iron contrasts seen so much in recent markets.



Room divider in cherry by the Hickory Mfg. Co. The divider is available complete or the base can be purchased separately.

An interesting innovation in the Unique Furniture Makers' space was the new wood being used—sweet pecan. This is one of the few instances at this market where an extremely hard wood is used in the manufacture of case goods.

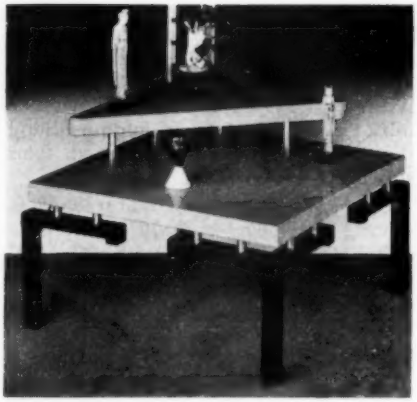
Typical of the trend toward rounded corners is the new bedroom suite offered by the Cavalier Corp. It is elm and the cases are rounded on the sides with a new kind of contour molding on the case fronts, giving an attractive shell-like outline. There are many pieces of case goods raised from the floor and upheld by slender brass-tipped legs, but there are still many manufacturers building case goods flush to the floor with recessed base.

Seen At the Market

Juvenile furniture that will grow with the youngster through the teen-age years was shown by several manufacturers.

Oxford Ltd., Kent of Grand Rapids, showed some sensational pieces in space 132. Here are a few of the pieces: occasional chairs in pumice wood with gold kid seats and woven backs; a long, single-cushion sofa in an alabaster blue opalescent leather, embossed with tiny gold fleur de lis; and coffee and occasional tables wtih tops of inlaid abalone shells.

An interesting dual purpose piece of



Heywood-Wakefield combines hard and soft surfaces. Black and natural accent for wood finishes and pagoda styling add to the Far Eastern atmosphere.

furniture was on display by Harris Pine Mills. This was a juvenile picnic table with attached benches in wood and wrought iron. Top of the table opens up to become a sand box. Another item was a wrought iron and wood tea cart.

Consider H. Willett has added a new desk, bookcase bed and cupboard with glass doors to the Trans-East group. This firm's Countryside Cherry group included a whole new bedroom suite in the red cherry.

Muskin Industries, Walkerton, Ind., offered 105 correlated custom colors for cabinets, chests, headboards, double dressers, and bookcases.

Two big features of Lane Cedar Chests this fall will be color and style. Lane has new two-tone enamel chests, charcoal gray, sand mahogany and many others. This firm is making vertical-type chests as well as the traditional style of cedar chest.

Gluck Brothers, Morristown, Tenn., introduced an unusual trundle bed—a complete sleeping-study unit for two youngsters. The footboard is a desk and study area, with two drawers so the youngsters won't argue over desk space.

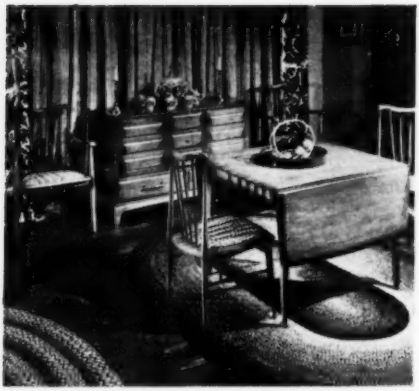
An unusual dinette table with half-moon shaped pedestal, brass tipped legs with brass bracelet at top and third supporting leg in the center was featured by Basic-Witz Furniture Inc. There were matching brass ferrules in the scalloped, cut-out apron trim of the table.

We've seen TV chairs and tables, but a TV bed! The Mengel Co. had one on display. It has a pull-out tray for refreshments and electrical outlets so programs can be switched from the bed.

Davy Crockett has entered the furniture business. There is now a bunk bed with a steer carved headboard. More may follow on this depending on how long he remains popular with the younger crowd.

Swivel rockers with brass trim are new. Black is combined with brown walnut in a striking dining room grouping. Phillip Reinisch Co., Chicago, offered a new line of solid walnut tables, featuring exceptionally attractive plastic tops in their Pagoda pattern. The plastic presents an exact replica of light-colored bamboo matting. Square brass tubing is used.

"Tahiti," by Ashley Furniture Corp. There is a solid melamine plastic top with maple legs which have been given an ebony finish.



Pecan wood finished in a rich nut brown by Unique Furniture Makers.

Tell City Chair Co. entered the market with a completely new line. The Italian casual group with pecan trim is available in junior or full size dining room suites. Another dining set is done in solid cherry. Occasional pieces of note include a brand new Colonial gossip bench in cherry and a tiny rocking settle.

Outstanding in the Hickory Chair Co. display was a room divider with a small desk in the middle. Exceptionally attractive was the Dorothy Robinson group of suites in dark solid mahogany. Magnetic catches were used on all of this furniture.

Thayer, Inc. presented a fine line of juvenile furniture. Basic pieces included a crib, two-drawer chest and sliding door cabinet. Drawer knobs were in the form of flowers with matching stems drawn on the surface.

The T. Baumritter Co. featured a 62" breakfront combination in their Birchcraft dining room group. The new dining room chairs were done in solid birch with legs and back combining an interesting arrangement of sculptured cantilever posts. Through this "engineering," pressure on the back of the chair is immediately transmitted to the seat frame.

Space-saving pieces by Saginaw Furniture, Inc., included kneehole or pedestal desks which, with a touch at the drawer, could be extended into dining tables for 8. A double pedestal desk or buffet also shown stored folding dining chairs of conventional size and lines styled in corresponding character.

Century Furniture Co. featured a sofa seating six people. A 72" six-legged coffee table correlated with this 100" sofa.

Changes Ahead

There will be many radical changes in the whole marketing picture within the next five years. Automation and new modes of transportation will combine to bring some of these about.

Automation techniques will become commonplace by 1960. This will mean a new class of wage-earners, the maintenance worker. It will mean shorter hours and more leisure time.

The prediction has been made that five years from today, half of manufacturing production and retail sales and one fourth to one third of national advertising will be in items that do not exist today.

The downtown area will be in a full-scale come-back that has already got off to a good start.

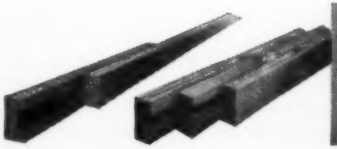
Manufacturers' diversification will continue and the trend toward full lines will be in full bloom by 1960.

Present-day advertising budgets will seem small by comparison with those of 1960. The advertised brand, however, will be even stronger.

We must find new and better ways to cut down the time lag between creation of desire for a deferrable purchase and its ultimate satisfaction. Our economy is built on selling deferrable purchases in ever-increasing quantities. Sometime ago it took a full year for a family to make up its mind to buy a rug. Today the time factor has been cut to a month. By 1960, it may be cut to a week.

Add Sales Appeal

Wabash Drop Leaf Supports with handy Dual Release win the ladies' vote every time. No more fumbling under the table . . . no more pinched fingers. Just a touch breaks both supports to fold the leaf. It's a real sales feature. Also ask about Wabash Slides, Folding Leaf equipment and Top Locks. Let Wabash help engineer your new patterns for smooth action . . . and sales. Write today for more information.



B. WALTER & CO., Inc.
Walter of Wabash
WABASH, INDIANA

Two-toning on this grouping by Basic-Witz is coral and gray, black and madeira, aqua and gray, madeira and black bases, gray and black bases.

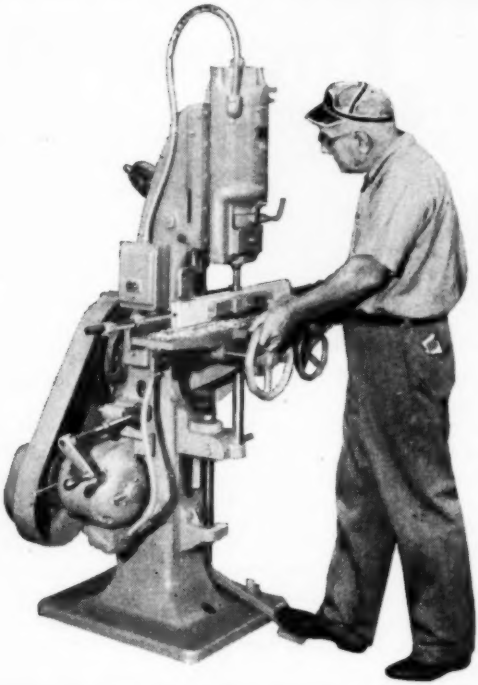
Let's Look to Our Laurels

Nathan S. Ancell, president of T. Baumritter Co., Inc., New York, spoke to furniture retailers. We are repeating the outline of his talk for two reasons: there is much food for thought in his remarks; and it will be helpful to furniture manufacturers to see some of the future plans which the retailer may be following to sell more furniture to the American public.

Our industry, Mr. Ancell said, cannot maintain its competitive position with other American industries, unless we are willing to face mistakes with a genuine desire to correct them. Too many of us are living in past glories, blind to present events. The "off list" revolution is a Frankenstein we have created by ignoring too many fundamentals. A few of the more important ones are:

Baumritter President Speaks

1. That through the lack of care and study, we have done a poor job of furnishing the homes of America.
2. We failed to recognize that our business is the sale of "home beauty" and not tons of lumber and fabrics at untrue comparative prices.
3. That the American Industrial Formula centers around the word "specialization" as is clearly recognized by other rapidly growing industries.
4. That the "general" furniture store is passing, because by trying to be all things to all people, it winds up being nothing to anyone.
5. That our market is now our children, not our parents, and they are the products of a vibrant maturing American cultural and educational system, leading to new home architectural horizons and rising living standards.
6. That "credit" is now a national institution and we can no longer use it as a crutch to support poor selling.
7. To be competitive we must abandon the philosophy of "how much we can charge" and substitute "how little can we charge and still make a profit."
8. That good looking, attractive and correlated home interiors aren't the monopoly of the rich, but rather a standard for all.
9. That night opening is here to stay because that is when consumers can buy most easily.
10. That the appearance of the average furniture store is itself an obvious answer to their serious lack of traffic.
11. That a dynamic revolution is taking place in the manufacture and marketing of home furnishings, in which you will either sink or swim depending on your ability to face realism and think clearly.



AN ALL-ROUND mortiser...Greenlee 227

for fast production, extra-clean work!

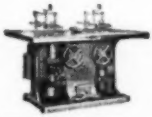
Here's the electric hollow-chisel mortiser that is ideal for all general mortising in furniture, sash, door and similar manufacturing. The GREENLEE 227-BM is of extra sturdy construction with many special features that simplify and speed production. Flexible power stroke feeds the tool to the work with perfect control — can be started and stopped instantly. Variable feed provides a wide range of strokes per minute to fit the exact work requirements. Anti-friction bearings . . . proper tool holders . . . air blast removes chips, cools mortising tools. Regularly rated for chisels up to 1" square, but can handle 1¼" or 1½" chisels for shallower mortising in soft wood. Get complete details now.

Write for Bulletin No. 227 GREENLEE BROS. & CO.
1867 Twentieth Avenue, Rockford, Illinois

GREENLEE WOODWORKING MACHINERY AND TOOLS The GREENLEE line includes tenoners, mortisers, borers, saws, planers, and shapers.

GREENLEE DOUBLE-END TENONER Renowned for quick, easy setup and wide versatility. Single-end Tenoners also made by GREENLEE.

GREENLEE SIX-ROLL SINGLE PLANER . . . exceptionally smooth in operation. Line also includes other single and double planers.



GREENLEE MOTOR DRIVEN SHAPER . . . all-round unit for high-speed, precision shaping.

MORTISING AND BORING TOOLS . . . Countersinks, Hollow Chisels, Multi-Spur Bits, Machine Bits and other tools by GREENLEE.

GREENLEE

Kent-Coffey brings best of traditional feeling together with smart contemporary.

Inevitable reduced margins should be welcomed and encouraged as the only sound method of making a profit. Our challenge is to minimize costs and to speed turn-over by concentration on fewer products and resources; thereby becoming expert in the correlation and coordination of selling displays; thereby making higher average sales at lower selling costs; thereby reducing markdowns substantially and eliminating ineffective and wasteful advertising expenditures; stores will then become a flowing conduit between maker and consumer instead of a "parking place" for inventory. As long as we hold umbrellas of high mark up and poor selling over the "off list" sellers, they will stay on.

Extravagant claims of price reductions are no more than a futile substitute for our lack of imagination and ability to make extravagant but honest claims of what our products and services can and must do to beautify the American homes. Constant extra-curricular warehouse sales are an admission of our inability to make our regular selling areas function.

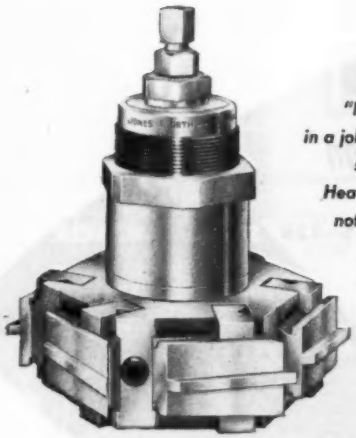
Our path to progress in our expanding economy is rather simple:

1. We manufacturers must amplify our market research into the needs of American homes and create more and better products to fit such needs.
2. You must do a professional job of exposing home furnishings to the public in an exciting, dramatic and stimulating atmosphere through the correlation and coordination of related furniture, fabrics, lamps, floor coverings and accessories.
3. You must learn to know every customer's decorating problem as well as her desires and dreams, so you may fulfill them for her benefit.
4. That you become a specialist in fewer categories and products and give your store a beauty, character and identity over a wide marketing area.
5. That we all reduce prices as rapidly as easier and more natural selling permits so that we as an industry can grow.

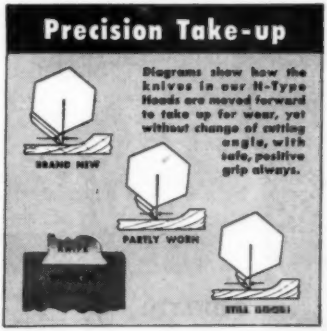
Our future can be bright, happy and constructive. If we team up together to perform for Mrs. America, we can double the size of our industry and at the same time make a vital and lasting contribution to our American culture and to the welfare of our homes and families.

Worry kills more people than work does, because more people worry than work.

"The sweetest running units in the plant!"



"I sure don't want any EXTRA worries in a job like mine! That's why we standardized on JONES & ORTH Cutter Heads a good many years ago. There's nothing in the plant that gives us better output per dollar with less grief, than these heads do. We're fussy about quality here too!"


Precision Take-up
Diagrams show how the knives in our H-Type Heads are moved forward to take up for wear, yet without change of cutting angle, with safe, positive grip always.
BRAND NEW
PARTLY WORN
KNIFE
STILL GOOD!

To get on top . . . and *stay* there, with tough production schedules, there's nothing that will do *more* for you, or take a bigger load off your mind, than JONES & ORTH Cutter Heads!

It's no accident that you get more for your money in our cutter heads. After all, that's all we make . . . just the *finest* cutter heads that money can buy! Our specializing pays off . . . *for YOU!*

Stocks? We've got 'em! Customers tell us that nobody in this field gives *quicker* and *better* service on either standard or special heads. Let's get together on this! *Write us TODAY!*

Write today for the name of our dealer nearest you! Address either our Seattle or Memphis branch.

Catalog? You bet! Let us send you your copy! How else can we serve?

JONES & ORTH

CUTTER HEAD COMPANY

385 SOUTH MAIN STREET
MEMPHIS 3, TENN.

BOX 3064
SEATTLE 14, WASH.

IF YOU WANT BETTER FINISH...
LESS WASTE... MORE ACCURACY...
HIGHER PROFITS...

You'll want NEWMAN MACHINES

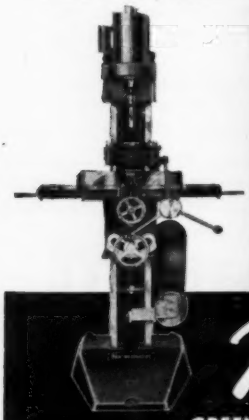
Geared to YOUR production

S—824 SINGLE SURFACER

K-16 VARIETY SAW

G-232 HYDRAULIC KNIFE GRINDER

T-20 MORTISER



The machines shown here are but a few of those manufactured in our big new modern plant which turns out a full line of up-to-the-minute woodworking machinery. Our staff of design engineers constantly seek newer, finer techniques and quality controls. All moving parts — shafts, pulleys, heads are dynetrically balanced for smooth vibration-free service and long productive life. Full details of any Newman Machine is yours on request.

— — Write today — —

Remember you'll always get more profit dollars from Newman Machines

— — Geared to your production.

G-16 PEDESTAL TYPE HEAD GRINDER

Newman

MACHINE CO., INC.

GREENSBORO, NORTH CAROLINA, U. S. A.

Profitable Production of LUMBER CORES

by
H. H. Connelly

"No gain is so certain as that which proceeds from the economical use of what you have."

TO THE man manufacturing wood products there is no wiser word than that. The raw material which the woodworker fails to use as originally intended reaches into fabulous figures over a period of a year's production.

One way of reducing such waste is to use low grade lumber for cores. Lumber-core plywood, as it is often called, is used for furniture, radio and piano manufacturing. It furnishes a firm base for decorative veneers that are produced in thin, fragile sheets. Being solid lumber, it imparts the necessary strength so needed in the construction of good furniture. Cheap lumber can be used in these cores and a minimum amount of equipment is needed. However, the equipment must be good and efficient.

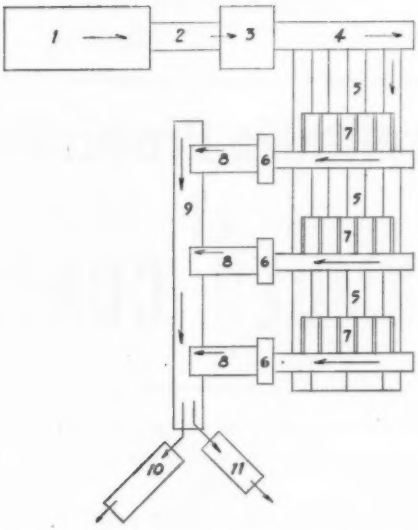
Here is an example of how one mill turned waste into money with little capital investment. Short cuttings of wide slabs (slabs usually contain the best grade of lumber in the log) were kiln dried and run through a cutoff saw for length. Defects were ripped out and a glue joint applied at the same time with a glue joint rip saw. An inexpensive ferris wheel clamp was installed and the random width rippings were glued into a wide core. The cores were run through the rip saw and sized for width. The rough length was left to be trimmed after the core had been laminated with veneer.

Here we have an extended operation consisting of two pieces of equipment—a rip saw and a clamp. A third, planing, is better.

Importance of Planing Lumber Cores

A concern manufacturing solid lumber cores in two operations may often receive complaints. A customer received cores that were apparently in excellent condition. However, when he planed the rough cores to the final thickness for laminating with veneer, enough defects were exposed to fill a hollow tree.

Worm holes, rotten, decayed, shakes, split lumber, thin boards, and season checks were the major theme of the complaint. A large proportion of all could have been eliminated with a rough



No. 1—Lumber Lift.
No. 2—Conveyor.
No. 3—Surfacer.
No. 4—Conveyor.
No. 5—Chain conveyor.
No. 6—Cutoff saw.
No. 7—Drop conveyor.
No. 8—Roller conveyor.
No. 9—Belt conveyor.

planing before ripping and gluing. All the thin boards could have been detected.

There are two places where rough planing can be performed—before cutting to length or after. You will find both methods widely used.

What are the advantages gained by planing the boards in the long length before cutting for stock lengths? The number one advantage is that the boards come to the swing saw operator with all defects exposed. At least the operator can better judge the grade before cutting to length and make a fair stab at separation.

A second argument for planing before cutting to length is that thick and thin boards can be detected before the length is made final. If the board is cut too short to go into the thin panel, it will require a lumber stretcher. On the other hand, if cut too long it leaves waste and requires labor to reduce it to the proper length. Why not do the job in one operation?

One furniture plant has a blackboard upon which all board lengths are posted as a guide for the swing saw operator. Lengths are posted for the daily schedule. Thus boards that can be re-planed and glued into a core of thinner dimension are cut to the proper dimension without later handling.

This has one other advantage to the manufacturer making dimension stock that requires high grade lumber. One concern has a solid maple bedroom suite in production. Clear cuttings are selected from the lumber as it crosses the swing saw operation. Without a pre-planing operation, many cuttings would be rejected as poor grade. After removing the grayed surface of seasoned lumber the selections are easily separated. And, by this separation, the manufacturer is able to obtain over 75% of his raw material from lumber of a lower grade.

The other position for the roughing planer in the lumber core setup is behind the cut off saws. The difference is found in the planer performance. Short boards can be fed to the planer and will clean up to a uniform thickness better than when in long lengths. This is especially true of boards that are twisted and warped badly in the long length. When shortened at the swing saw the degree of twist is minimized and goes through the roughing planer instead of up the dust pipe.

Another mill using this type of setup has a second planer following the first with the cutoff saws between. Boards which fail to plane out are cut to the next length and re-run through the second planer, reducing the thickness to that required for thinner panels.

This isn't necessary. The random width boards can be glued up and planed as a core. But to reduce a thick core to a thin core at one planing requires a double planing in most instances. We save in labor.

Selection and Maintenance of Roughing Planer

What type of planer is best for this operation? One mill not familiar with planers, selected a planer designed for finish surfacing. There is a distinct difference.

A roughing planer is designed to take care of a wide variable in the rough thickness of lumber. A finish planer, designed with a minimum feed roller and pressure shoe opening, does not adjust itself readily to the difference found in rough lumber thickness. Consequently when planing rough lumber on a finish planer the stock goes into the machine but hangs frequently during the operation. Two boards of unequal thickness will not pass through the machine at the same time.

The feedworks, bearings, gears, sprockets and roller chains constitute the majority of the moving parts of any planer. Select a roughing planer with these parts adequately protected from grit and sawdust. The best machines have the drive mechanism sealed in a cast iron housing with the chains running through a reservoir of clean lubricating oil and carrying a continuous bath to every corner of the drive.

The chipbreaker is an important part of the roughing planer. A well designed roughing planer has the chipbreakers built in sections, composed of rocking shoes that maintain an even pressure on the stock as they ride over irregular surfaces.

Good suction for disposing of shavings and chips is essential in obtaining good work from your planer.

A minimum suction head of 3½" of water should be maintained in each branch pipe leading from each hood. A suction head test can be made by placing one end of the rubber tube over a small hole in the branch pipe near the hood or chute and connecting the other end of the tube to a U-shaped water gauge and noting the difference in water level between the two sides of the gauge.

Check the area of the main exhaust pipe. It should be equal to or slightly larger than the sum of the areas of the branch pipe.

If your suction is still below par, check the elbows or turns in the pipe. These should have a radius in the throat at least equal to or greater than one and one-half times the diameter of the pipe. Branch pipes should never enter the main pipe at right angles but should be connected at an angle of from 30 to 45 degrees. Neither should branch pipes enter the main pipe from the bottom, but from the side or top. Further, do not have two branch pipes entering the main pipe directly opposite each other.

Efficiency Demands Modern Cutoff Saws

In the rough lumber lineup, little has been mentioned of the type of saws used to cross cut boards to stock length.

Obviously the element to be gained at this operation is time; and the type of saw that can produce the most footage per man hour is the prime factor to be considered in choosing a machine for the cutoff operation.

In other words, we could use a handsaw, but obviously we are on the lookout for a tool that will save money. It must stand on its own feet and, like every modern production machine, save its entire purchase price in a few months. Further, the saw you choose should go on, year after year, doing the job without adjustment and without burdensome maintenance.

One type that has proved dependable throughout the years is the counterweighted type that requires minimum effort to swing the saw across the board.

Manufacturers of this type of saw have recently simplified its operation. All mountings have been replaced with smooth ball bearings that require less than a pound of force to start the saw into the wood. In addition, the saw has been constructed on a heavy rigid frame that can be moved about to accommodate changes in machinery lineup. When operating, the saw is pulled along the perimeter of an arc, with the center of the arcs being the point upon which the saw frame is fastened.

Because of its simple design, this type of machine is the least costly and gives the least mechanical trouble.

Some years ago another type of saw was developed that eliminated the necessity for the large swing frame.

In this machine, the saw is mounted on a movable carriage which carries the saw in a straight line through the board. One type is constructed with an aluminum carriage, making the machine light in weight and permitting the operator to actuate the saw with the minimum amount of energy. As much as 10% more production can be gained by this type.

Still a later improvement of this type of saw has been the addition of a hydraulic unit that leaves the operator's hands entirely free to handle the board.

This, you will find, is advanced planning in woodworking machinery. The electric switch that operates the saw is at the operator's feet, and automatic kicking devices can be installed to free the cut board from the gauge.

With a machine of this design, provided conveyors are used to remove the lumber from the saw as fast as it is cut, the operator is able to process over a thousand board feet per hour of four quarter lumber.

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- solid or laminated
- corestocks, blocks
- wood-and-plastics
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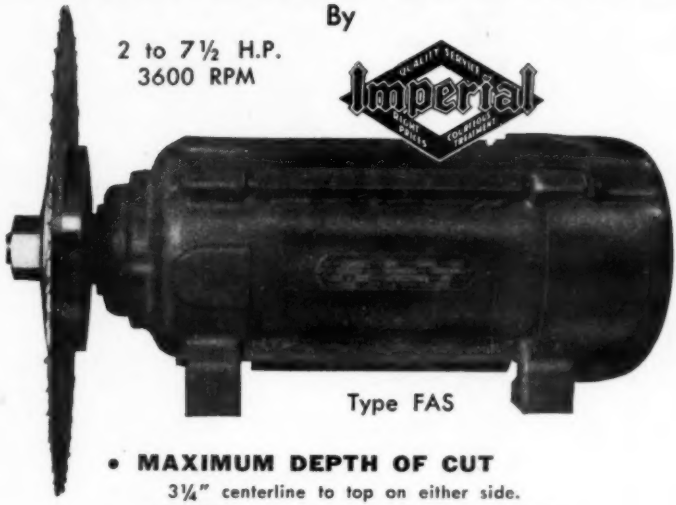

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  3¼" centerline to top on either side.
- **ABSOLUTE RIGIDITY OF ARBOR**
  Massive arbor extension up to 2" dia.
- **SMOOTH CUTTING**
  Taper-mounted saw-flange and no end-play of arbor.
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- **SELF-CLEANING**
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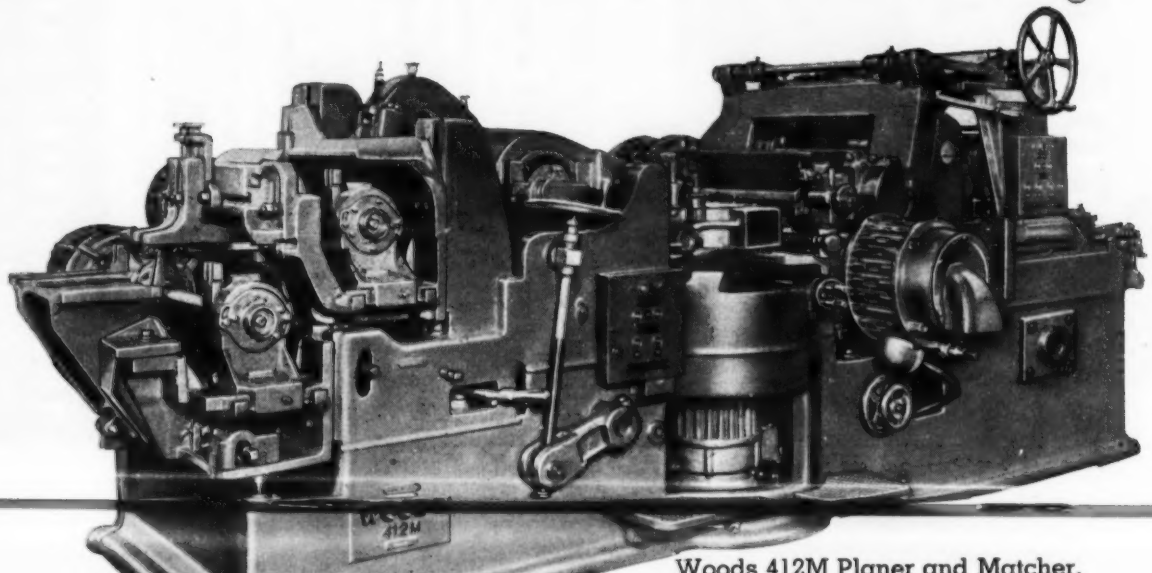

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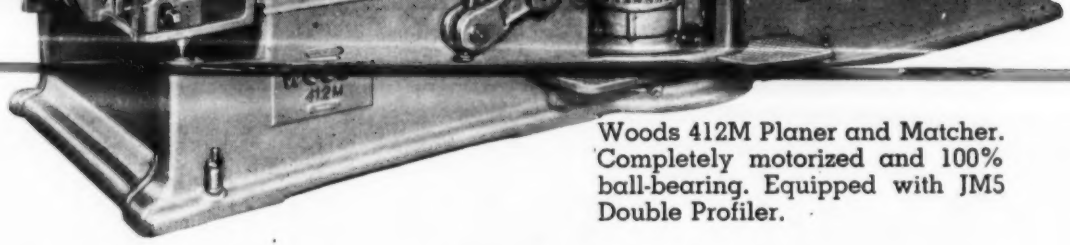

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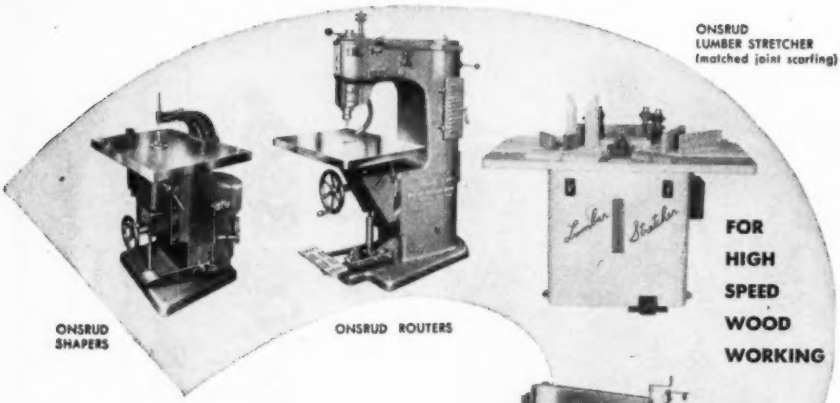

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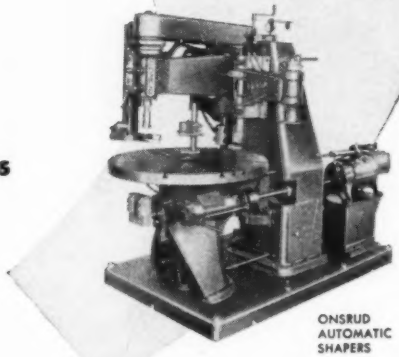

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* see "Effect of the New Tax Law on Equipment Replacement", by William Meyers, Machinery magazine, October 1954 issue.

Part 20

By Paul H. Graham

INVESTIGATION into the development of dry kiln building construction seems to show that progress in this field has not kept pace with developments in improved dry kiln equipment and modern kiln drying practice. Possibly this would be more properly stated by saying that the woodworking industry as a whole has not taken proper advantage of improved kiln building design and construction materials that are currently available. The fault would appear to lie with the user-plant rather than the dry kiln manufacturer or engineer.

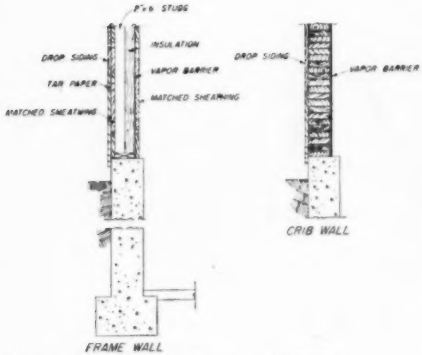
Most commercial dry kiln manufacturers have maintained a constant record of performance of their various dry kiln installations for cumulative analysis and study. From these histories and applied research they have developed kiln building designs and construction material specifications best suited for individual plant conditions and kiln drying requirements. They have even gone so far as to develop prefabricated kiln buildings, which with their dry kiln equipment, are delivered complete as a package ready to assemble and require only an adequate foundation to be supplied by the customer.

Reasons For Poor Kilns

Analysis of reasons for so many poorly constructed and inadequate kiln buildings traced the principal cause to lack of sufficient information regarding construction requirements and building material characteristics. The most frequent contributing factor appeared to be the basic desire to erect the kiln building as cheaply as possible, regardless of the fact that the building would be required to house valuable lumber and expensive dry kiln equipment and be subject to much more severe conditions of heat and moisture than any other building in the company.

Commenting upon the effects of poor kiln building construction, a dry kiln manufacturer's representative pointed out: "A poorly built kiln will leak like a sieve. The leakage may be expressed in heat units, coal, oil, gas or dollars, but it always represents a substantial loss. The amount of heat lost by radiation and convection from the kiln building depends upon its construction and conditions of the outside air, which means that differences of temperatures, humidity and wind pressure, will mean variation of heat loss in a greater or lesser degree.

"Therefore, the efficiency of the heating medium of a dry kiln is to some extent dependent upon construction materials and type of construction. If the material has a high thermal efficiency or, in other words, has a great



Courtesy Forest Products Laboratory.

Fig. 1. Sketch of wood frame and crib walls showing arrangement of components.

capacity for absorbing heat and radiating it into the outside atmosphere, it is obvious that, as the heat is taken from the air of the kiln, it is to all intent wasted, decreasing the efficiency of the heating medium, and consequently causing waste of steam."

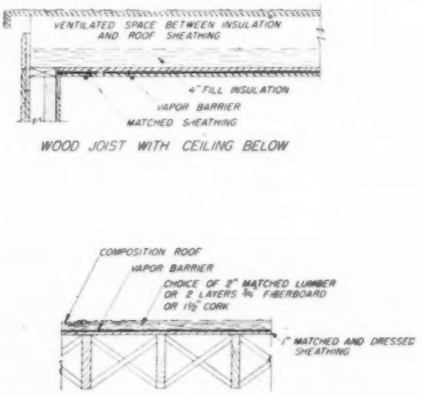
Early kiln buildings were generally carelessly cheaply constructed. Little attention was paid to proper location of the kiln and water seepage into the kiln was as common as leakage of heat and steam to the outside atmosphere. Insulation and vapor barriers seem to have been relatively unknown. The location of the dry kiln in any mill yard was usually signalled by escaping steam. It is unfortunate that the same conditions prevail often today.

A wooden kiln recently inspected had been built only three years. It was a wood frame building with wooden roof and doors and a dirt floor. The building was located in a slight valley separated from a small pond by the main plant buildings. When water was pointed out on the floor of the kiln, the owner said that seepage always accumulated on the kiln floor during rainy weather and the floor was damp most of the time.

The wooden doors were almost rotted through and the walls were in a sad state of deterioration. Hangers supporting steam coils were gone in some instances. The track upon which the doors hung sagged to such an extent that four men were required to open and close them. The roof had settled in a number of places, so that rain and snow dripped through on the lumber. The tracks dipped appreciably in different sections of the kiln and it was said that lumber loads were frequently dumped in moving them in and out of the kiln.

Precautions In Planning

Our kiln drying experience has showed that for efficient dry kiln operation, the walls and roof must be kept dry and free from vapor condensation and penetration to prevent decay and deterioration. The doors must be tight and well insulated to avoid leakage which upsets uniformity of conditions within the kiln. It is important that all pipe openings be sealed with suitable calking material, such as asbestos or magnesia, that may be easily removed for pipe repair when necessary.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VAPOR BARRIER
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WOOD JOIST WITH CEILING BELOW
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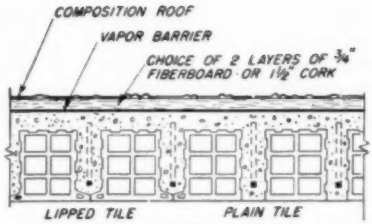
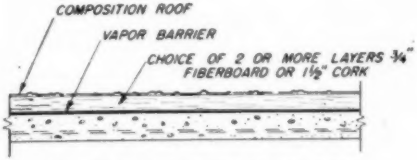
STANDARD JOIST CONSTRUCTION

Courtesy Forest Products Laboratory.

Fig. 2. Sketch of standard wood roof types, with and without ceiling.



TILE AND CONCRETE ROOF



REINFORCED CONCRETE SLAB ROOF

Courtesy Forest Products Laboratory.

Fig. 3. Sketch of roof types: tile and concrete roof; and reinforced concrete slab roof.

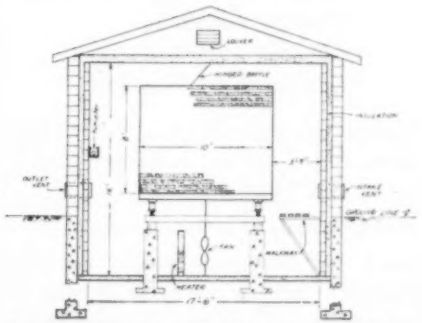
The kiln building must be properly situated. Dry kiln manufacturers recommend that soil and water conditions at the proposed kiln site be analyzed before the building is constructed. If insecure soil or water seepage conditions are found, it is further recommended that the services of a competent architect or engineer familiar with local conditions be secured to determine a suitable sub-surface foundation.

Since water seepage into the kiln seriously disrupts drying conditions, kiln buildings located near rivers, lakes or ponds, or erected above a high water table, should be raised above the water seepage level. A firm kiln foundation is necessary to prevent any subsequent misalignment of the building which might cause the walls and roof to crack and throw the trackage system, fans and heating coils out of line, causing them to function improperly.

The dry kiln must withstand wind and weather and also combat extreme changes of temperature and humidity, with resulting expansion and contraction, and the destructive corrosive action of acid vapors. The building must have good resistance to the transmission of heat and vapor. A good measure of fire resistance is also desirable, and is required by building codes and insurance regulations in some localities.

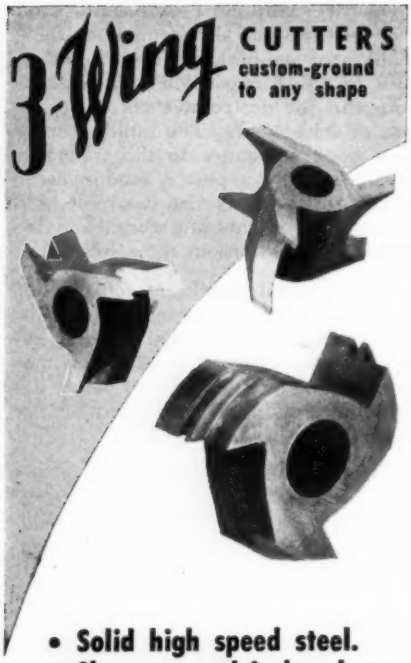
Choice of kiln building construction materials is usually based upon initial cost, availability and local building requirements. One should also know material characteristics well to better determine suitability and protective properties.

If it could be obtained, the ideal dry kiln building construction material would have a low initial cost; be readily available within the area of construction; be easily worked and erected; have good moisture, weather and wind resistance; be easy to repair; have a low factor of radiation, high insulating value, and a low U value of heat conductivity or transmission; be decay-resistant and have good resistance to corrosion; be non-inflammable and impervious to high heat; and be long-lasting with good strength and load-



Courtesy Forest Investigations Branch, TVA.

Fig. 4. Schematic drawing of lumber dry kiln shows footings, foundation, insulated wall and double roof construction.



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bearing properties. Unfortunately, to date, there is no one material available that combines all of these properties in a fully satisfactory manner.

This fact has lead to the development of a number of materials especially designed for dry kiln buildings which combine the various desirable properties of the component materials to better meet exacting requirements of dry kiln construction in combination form. These materials may be prefabricated or may be incorporated separately into the construction of the kiln building in a relationship which approximates the advantages of combination materials of integrated fabrication.

Construction Standards

The need for guesswork in the evaluation of construction material characteristics has been practically eliminated by the provision of organized tables in various publications to show the U value, or coefficient of heat transmission for structural combinations of material used for kiln walls and roofs.

As explained in the Forest Laboratory report No. R1646, "Dry-Kiln Building Materials and Construction": "It is common engineering practice to express heat conductivity or heat transmission as the amount of heat in British thermal units (Btu) that will pass in 1 hour through 1 square foot of a given material of stated thickness. Where a combination of material is involved, such as in a completed wall, a value called coefficient of Transmission or U value is obtained. The U value for any combination of wall or roof material with or without insulation can be calculated and its relative resistance to heat transmission be compared to that of other combinations or materials."

This report presents tables listing a number of combinations of dry-kiln walls and roofs. The U value represents the loss of heat in Btu's per hour per square foot per degree of differ-

ence in temperature on opposite sides of the unit of wall or roof. The lower the U value the lower is the heat loss.

There are also various builder's handbooks, construction, heating and ventilating guides which also list U values for various materials and combinations. Many dry kiln manufacturers also make this type of information available to customers and prospective customers.

The FPL report explains: "Kilns of construction types having walls and roofs with the highest U values will consume the most steam in their heating coils, their temperatures and humidities are likely to be variable, their drying conditions will not be uniform and the kiln drying time of the charge may be extended. Kilns of construction types having walls and roofs with the lowest U values will use less steam in their heating coils, their boiler load will be reduced, and the drying time of their charge will be minimized."

A typical listing of U values for commonly used kiln building construction materials (based on wind velocity of 15 m.p.h.) from the American Society of Heating & Ventilating Engineers' guide shows the following:

Framewalls (Studs with exterior and interior finish—no insulation between studs):	
Wood siding, sheathing, various interior finish	.33 to .12
Wood shingle, sheathing, various interior finish	.25 to .11
Brick veneer, sheathing, various interior finish	.37 to .13
Stucco, sheathing, various interior finish	.43 to .14
Masonry walls (without exterior or interior finish):	
Solid brick:	
8-inch thickness	.50
12-inch thickness	.36
16-inch thickness	.28
Hollow tile (with stucco exterior finish):	
8-inch thickness	.40
10-inch thickness	.39
12-inch thickness	.30
16-inch thickness	.24

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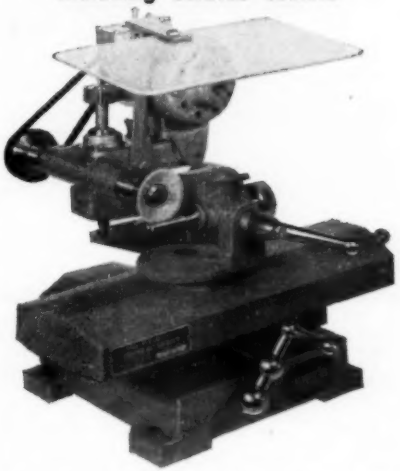

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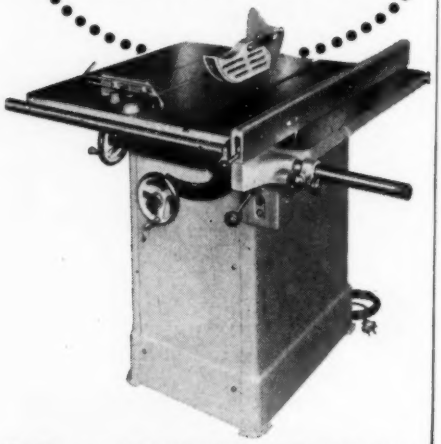

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16-inch thickness	.49
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8-inch thickness	.70
10-inch thickness	.63
12-inch thickness	.57
Hollow concrete blocks:	
Gravel aggregate:	
8-inch thickness	.56
12-inch thickness	.49
Cinder aggregate:	
8-inch thickness	.41
12-inch thickness	.38
Expanded slag, burned clay:	
8-inch thickness	.36
12-inch thickness	.34
Brick veneer, with:	
Hollow tile (clay):	
6-inch thickness	.35
8-inch thickness	.34
Concrete:	
6-inch thickness	.59
8-inch thickness	.54
Concrete block (gravel):	
8-inch thickness	.44
Concrete block (cinder):	
8-inch thickness	.34
Concrete block (expanded slag, burned clay):	
8-inch thickness	.31

U values of frame walls may be further reduced by insulation between studs; for masonry walls, by interior finish with plaster, insulating boards, etc. Provision of an air space and suitable barrier material operate in a similar manner. For example, a wall made up of 4 inches of brick, a 1-inch air space, aluminum foil, and 4 inches of brick has a U value of .32.

Some U values of structural combinations or combinations of roofs listed in the FPL report No. R1646 include:

Roof sheathing, 25/32 inch and composition roofing	.485
Roof sheathing, 1⅝ inch vapor barrier, 1⅝ inch sheathing and composition roofing	.246
Ceiling, 25/32 inch, 2-inch blanket insulation, ventilated attic under roof	.105

Concrete slab, 4 inches thick and composition roof	.720
Concrete slab, 4 inches thick, 2 layers of 3/4-inch fiberboard or 1 1/2 inch cork composition roof	.170
Tile and concrete slab, 10 1/2 inches thick, composition roof	.238
Tile and concrete slab, 10 1/2 inches thick, 2 layers of 3/4-inch fiberboard or 1 1/2-inch cork composition roof	.106

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DOES IT PAY?

By V. K. Anderson

Safety Director, Kroehler Mfg. Co., Binghamton, N.Y.

"It" is good housekeeping. What about the statement —does it pay? Most of us will admit that good housekeeping does pay, but we can't seem to spark much enthusiasm about it. Why?

YOU see by association we don't approve of the word. We like words such as manpower, horsepower, materials, efficiency and cost. They're within the man's world and scope of understanding.

Therefore, when, for lack of a better word, our management starts on a Good Housekeeping Campaign the first thing we can think of doing is to raise Cain with the janitor for not sweeping up often enough. Now this is a perfectly normal reaction since surely the boss doesn't mean, cooking, washing and making beds. There remains only one thing left and that's to sweep. At least sweep the aisles and in front of the benches and machines and hope the boss doesn't look in the corners.

About 20 years ago I received my first introduction to the job of line supervision. I was taken from the bench in a chemical laboratory and assigned a department as production foreman. Just like that! If I hadn't had a swell guy (but tough) for a department head, I'm sure I would have failed miserably. He was also a chemist and a sticker for accuracy, precision and orderliness. One of the first things he taught me was that there was a place for everything and everything not being actually used should be in that place. If there wasn't a place for everything there remained one of two things to do: either find or make a place or get rid of it.

I remember distinctly lining up a batch of acid carboys and having him sight along the protruding edge and find one out of line about one inch. I remember the lessons he taught in piling steel drums. Build pyramids in the standing position or lying them on their side. A broom, rake or any hand

Good housekeeping begins at home.

implement when not being used had to be in a rack or cabinet especially for the purpose. I recall his emphasis on cleanliness and orderliness. He used to say, "sure you can't forever be following your group picking up after them but you can gain their cooperation by setting a good example and insisting on every last soul following your example. Your own desk is a place to start."

Home Influence

Our own home environment has a great influence on the acceptance of cleanliness and orderliness. For instance, each of you must know of a person whose home and yard is disarranged, piled with trash and where last week's paper is filed under the sofa. You can bet your bottom dollar that the work place of that individual will be in the same condition if such conduct is permitted. Orderliness is a sign of efficiency.

In the woodworking industry we have witnessed lumber stacked to air dry or kiln dry. If the stack is neat and the stickers placed one under the other, straight and true, there is not only the quality of workmanship, but a quantity of straight lumber. Observe a line up of production machines. Those in straight line production tend to keep the flow of work orderly and efficient. The back tracking for production needs causes inefficiencies, lack of proper storage and work space.

Most of our work in wood processing plants is by batch loads necessitating both full and empty trucks. Space for both in the work area is essential. In the temporary storage area trucks lined up, all facing the same direction, make it more convenient and save valuable space. The adequacy of the dust collecting system is of considerable consequence in maintaining good working conditions.

What it all boils down to is that housekeeping means more than sweeping in the aisles. It means cleanliness, yes, but more important is orderliness.

As is said in all staff functions and particularly accident prevention, we must first have a convinced top management, desiring an efficient plant. We must all agree that every effort, whether quality of product, good working conditions or orderliness, cost either time or money or both. In the program I am describing, time is of the greatest consideration, only in small doses however, applied on regular occasions.

The president of our company is a "bear" on good working conditions. He has been known to visit one of our plants and finding some obstruction in

Too much underfoot put him in bed.

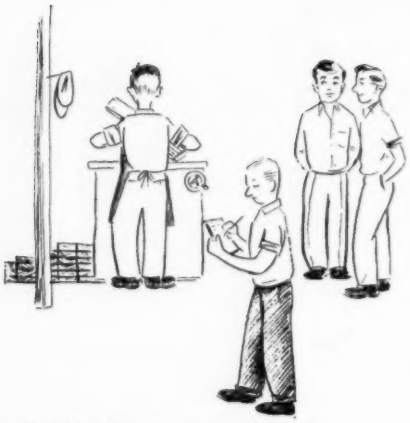
HOUSEKEEPING RECORD

DATE _____

	Not Acceptable	Needs Attention	Acceptable	Outstanding
1. Is area free of milk bottles, coke bottles, garbage; and obsolete materials?				
2. Are all posts clean and nothing hanging on them; are outer garments kept in lockers when not in use?				
3. Are all windows clean and unbroken?				
4. Is desk and office clean and tidy?				
5. Are all floors, walking surfaces, and other areas, clean and free from debris?				
6. Are all trucks and furniture straight and behind aisle lines or in designated areas? Are all empty dollies stored uniformly and in good order?				
7. Is fire prevention equipment ready for use? Are all inflammable materials properly stored and covered?				
8. Are beams and light shades dusted?				
9. Is wash room area clean and orderly? Is drinking fountain area clean?				
10. Is machinery and equipment in good repair—painted and cleaned regularly?				
11. Is department free of obsolete machinery and equipment?				
12. Are work benches clean and orderly?				
13. Are materials, supplies, containers, etc. limited in quantity and stored neatly?				
14. Are aisles clearly marked?				
15. Are filing cabinets orderly, with no papers or miscellaneous items on top of cabinets?				
16. Is bulletin board free of out-dated material?				
17. Are all materials piled at least 15″ below sprinklers?				
18. Are machines & equipment covered when not in use?				

How do you rate this department? - Not Acceptable - Needs Attention - Acceptable - Outstanding

RATED BY _____



Weekly check-up in work area.

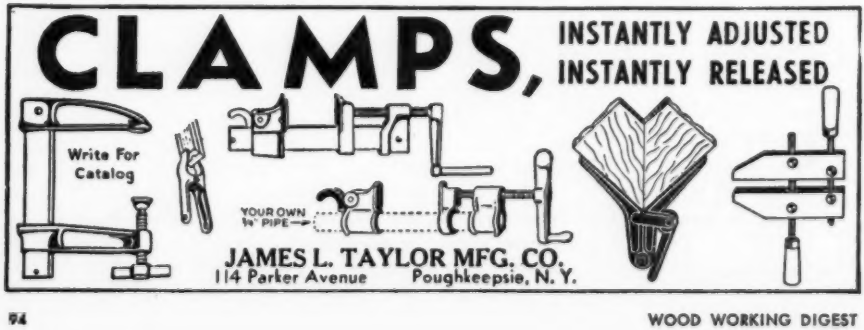
an aisle to immediately leave the plant and return to the home office. After traveling as much as 2,000 miles to make the visit, you can bet that works manager was later told about it.

With that attitude on the part of top management being repeatedly expressed, it is one of the prime responsibilities of the managers of the 17 plants to "keep their houses in order." It is not always as easy to convince first line management and the operators that their responsibilities also extend in that direction. In fact, it often requires considerable doing to keep working conditions on a par with company policy. Several attempts were made to obtain results through foremen's meetings. Photcgraphs were also taken of poor conditions and all supervision supplied with pictures of the "horrible examples." Occasional memorandums calling attention to congestion, obstructed aisles, dirty drinking fountains, etc. was tried. In each endeavor some improvement was noticeable but failed to last very long. Two years ago we hit upon a scheme that has so far worked. The plan has had a number of ramifications. However, the one being used operates something like this:

A foreman's housekeeping contest was inaugurated with suitable recognition given the top ranking department foreman each 10 weeks. In order to properly rate each section of the plant, six inspectors were appointed each charged to make a weekly survey of an area assigned. Areas were rotated each 4 weeks for each inspector. The inspectors appointed were: 2 superintendents, purchasing agent, pay master, production manager and industrial relations manager. A form was developed which required the inspector to rate the department in one of four categories (Outstanding - Acceptable - Needs Attention - Not Acceptable). There are 18 specific items to be checked.

The inspector is required to make notations on the back of the form when specific conditions are not up to standard.

These weekly inspection sheets pass over the works manager's desk and notations on the form are often made by him. A score sheet is compiled and



this sheet showing the standing of each department plus the rating sheet for the individual foreman is sent to him.

Recognition to the winning foreman has been of a number of types. The first year a suit of clothes was given to the outstanding department foreman each 10 weeks. Stetson hats were awarded at another time, photographs, articles in our house organ were also used. The winner and runner up in one contest were sent to the Silver Bay Industrial Relations Conference on Lake George. The size or type of award, in our opinion, is not too important, it's the recognition for outstanding work that counts.

Since this program has been in effect we have noted a marked improvement in our housekeeping. Of particular interest are the comments and conduct of our complete work force. In making inspections the "inspectors" are continually being approached by the operators explaining that a certain situation is only temporary or that a truck protruding over the aisle line was about to be moved. Since most "inspectors" are fluent in their compliments, even to the operators, for good appearing work areas considerable rivalry exists among the operators themselves. This, of course, is the ultimate goal of the campaign. When we reach a point where all of the operators are sold on the beneficial effects of clean, orderly surroundings we can discontinue our continual efforts in this direction.

There are other ways to achieve orderliness and cleanliness in woodworking plants, the important point is to do something to encourage good working conditions.

An excellent industrial safety conference was held in Syracuse, New York during May. Mr. Anderson presented much of this material to those attending the conference.

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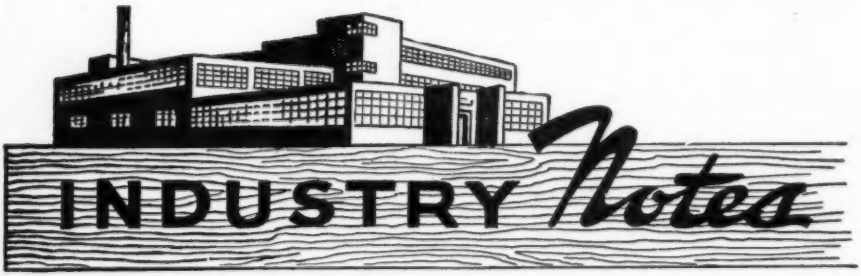


Cabinet Manufacturers Organize

A nationwide trade association of wood kitchen manufacturers is underway. The association's purpose will be to work toward the highest standards of quality and to promote wood kitchen cabinets for their inherent beauty, durability and easy maintenance.

Safety Award

Behr-Manning Division of Norton Co., Troy, N.Y., has earned the National Safety Council's Award of Honor for 1954. Nearly 2000 employees worked 4,000,000 manhours with only 12 lost-time injuries.

New Representative

Tyee Machinery Co., 1924 First St., S., Seattle, Wash., has been named by the Ekstrom, Carlson & Co., Rockford, Ill., to serve as their exclusive representative in Washington, Idaho and Montana.

Atkins Names Distributor

Atkins Saw Div., Indianapolis, has announced the appointment of the E. F. McCarthy Co., Inc., Buffalo, N.Y., as industrial distributor in this area.

Furniture Fair

Complete information on the fair is available from the National Association of Furniture Manufacturers, 666 Lake Shore Drive, Chicago. The NAFM Supply, Equipment and Fabric Fair, August 28-September 1, will be held at the Conrad Hilton Hotel in Chicago. More than 4000 furniture manufacturers have been invited to attend.

Trouble Shooting Course

The University of Michigan Wood Technology Laboratory, Ann Arbor, Mich., is offering a course designed for plant managers, superintendents, foremen, etc. The course emphasizes analysis of costly reject parts in all stages of manufacture to determine the cause and corrective measures that can be taken. The topics and problems covered will have application to most wood manufacturing industries.

Union Tool Buy Wallace

The Union Tool Corp., Warsaw, Ind., has purchased the assets of J. D. Wallace Co. The purchasers will continue the manufacture of the Wallace line of machines.

High Frequency Heat School

Unusual demonstrations of high frequency heat and its use in gluing and laminating wood products will be a feature at the Teco short course in wood adhesives, August 22-26, Timber Engineering Co., Washington, D. C. J. S. Twaddell, Jr., Radio Receptor Co., New York City, is a guest lecturer for the course.

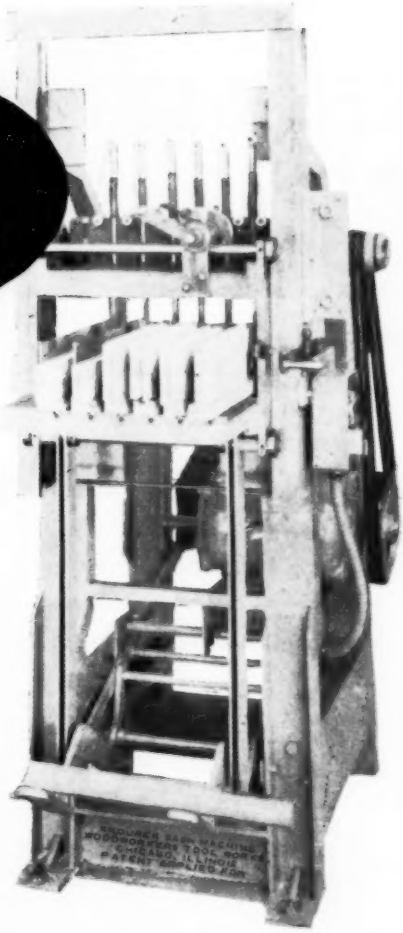
Shopmaster Sold

Jones & Lamson Machine Co., Springfield, Vt., has bought Shopmaster, Inc., Minneapolis, Minn. Shopmaster manufactures power tools for light production use and home workshops. This line will be carried on by the new owner.

Quality Control Course

The fourth in a series of short courses on statistical quality control in the wood

KNOUREK SASH MACHINE



A SENSATIONAL DEVELOPMENT . . .

In the art of sash making (combined check rail slotter, tenoner and coper). Designed especially for cost-conscious and efficiency-minded managers . . . saves time and labor. THE KNOUREK sash machine has six stations permanently set up to slot top and bottom check rails, cope top and bottom rails and stiles.

WRITE FOR CIRCULAR

Note machine stations are loaded with two bars and rails in each for large production.

WOODWORKERS TOOL WORKS
222 S. JEFFERSON ST. CHICAGO 6, ILL.

industries will be held September 12-16, Bent Creek Ranch, Asheville, N.C. The course offers intensive training in methods of statistical quality control with special emphasis on milling, gluing, finishing, sanding, veneer drying, grading, etc.

New Policy

The Hardwood Dimension Manufacturers Association has adopted a new policy whereby the hardwood parts produced by its members will be identified by a "Certificate of Origin." This

Certificate of Origin

will be attached to every invoice of H.D.M.A. members, and signifies high quality standards.

Appointments

U.S. Plywood Corp. has elected **L. B. Olmsted,** vice-president. He will continue as general manager of U.S.-Mengel Plywoods, Inc., a chain of 15 southern warehouse distribution units. His office is at 1215 S. 7th St., Louisville, Ky. **Richard J. Brown** has been appointed sales promotion manager for U.S. Plywood.

Henry R. Merrill has been appointed general sales manager of the Behr-Manning Division of Norton Co.

Formerly executive vice-president, **Conde Hamlin** has now been elected president of DeWalt Inc.

The **Jenkins Woodworking Machinery Division** of Curt G. Joa, Inc., announces the appointment of the Garrison Machinery Co., Inc., of Statesville, N. C., as their exclusive representative in the

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• The No. 67 is a medium size matcher of modern design and rigid construction. It is widely used by producers of building material, such as ceiling, flooring, siding, etc. Furnished with a profiling attachment when so ordered. Dresses 3/8" - 6" thick, and 2" - 15" wide. Weighs 9,000 lbs. We make larger and smaller 4-side matchers. Vance machines are well known and widely used throughout the lumber industry. Get additional information today.

J. A. VANCE COMPANY WINSTON-SALEM, NORTH CAROLINA

states of Virginia, North and South Carolina.

R. F. Parker, formerly a sales engineer, has been appointed manager of carbide component sales for Carboloy Department of General Electric Co., Detroit. **Frank M. Mansfield III**, manager of product programming has been appointed manager of product planning and marketing research for the company.

Weyerhaeuser Sales Co. has promoted **George D. Schwartz** from the position of sales representative in the Central Division to manager, Industrial Sales for the Weyerhaeuser Hardboard Department.

Arthur E. Darcy, abrasive belt machine specialist, has been appointed manager of the Machine Methods Department of the Coated Abrasives Division of the Carborundum Co.

California Redwood Association has appointed **Owen T. Stebbins** as promotion manager. He has been with the association since 1951.

Western Pine Association has announced that **Dale Grimm** will be the organization's field representative in New England and New York.

Einar F. Anderson of Marine-on-St. Croix, Minn., has been named eastern sales manager for adhesives by Monsanto Chemical Company's Plastics Division. He will move to the Springfield, Mass., headquarters.

Arthur N. Williams has been appointed president and chief executive officer of Haskelite Manufacturing Corp.

Atlas Plywood has elected **Robert A. Muller** as president. He succeeds the late Elmore I. MacPhie.

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Now, one versatile machine for all types and sizes of Boring, Routing, Large Diameter Countersinking, Grooving, etc. Model 601 does each of these jobs *at the proper speed with accuracy*. Wide speed range is *instantly* available, reduces set-up time. No lost time changing speeds or over to other machines. Results . . . lower costs, less fatigue, higher quality.

FEATURES: Variable speed precision spindle with built-in back gears, driven by a ½ HP single or three-phase motor. Completely enclosed drive head design; no belt changing required. Convenient direct reading *infinitely variable* spindle speed control dial. Quick-set depth control with fine adjustment. Built-in work light. Heavy construction plus precision machined for accurate, dependable performance in bench and floor models. Standard chuck capacity, 0 to ½".

Write for FREE DATA on Model 601 and ¼" Chuck Capacity High Speed 2500 to 15,000 RPM Manual or Air Feed Models. Custom boring machines designed to do your specific job.

THE ELECTRO-MECHANO CO.
264 East Erie St. **Milwaukee 2, Wis.** MODEL 601

Bulk Glue Storage Suggestions

By Russell Gerleman

BULK shipment of glue is now an economical and accepted method in the woodworking industry. However, the interest in bulk delivery, also raises the questions: How will I store it, and where will I store it?

Many plants have accumulated several empty drums. Clean drums are the ones that remain clean because the bungs were replaced after the glue was emptied from them! These drums provide for bulk storage until storage tank purchases are decided upon.

For bulk glue shipments the customer's glue requirements should be 20,000 lbs. or over, unless a neighboring wood plant or plants are interested in sharing the tank with you. A glue tank truck will carry an average of 30,000 lbs., half a tank being delivered to you and half to your neighbor. This can be further divided into 10,000 lbs. or one-third of a tank if the plants are in the same locale. Drums or storage tanks can be filled with the tank truck's power take-off in very little time.

Glue storage tanks are available in carbon steel or glass lined varieties. The glass lined tanks are considerably more in cost but last longer. They are easier to clean and completely eliminate the chance of rusting.

The most popular glue storage tanks today are carbon steel, uncoated or coated with an acid-resistant paint. Many people believe that if an uncoated steel tank is completely filled with resin at the start, resin will form a protective coating that will seal out the air. This may be true in some cases, but the use of an acid-resistant paint is recommended because tank condensation can wash the protective resin coating from the lining of the storage tank and start rust and corrosion. By using an acid-resistant paint your tank will last longer and your resin will remain its original milk-white color.

Rust in drums or steel tanks is readily recognized in the color of the resin. This is your indication of a coating need. Tanks should have a manhole for cleaning and inspection tasks. All of the lines and valves and the pump should be rinsed with hot water periodically and completely drained again before a new load of resin is pumped in.

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Proved best labor-saving device for handling loads of lumber level to level, or adjusting loads to easy working height. Write for full information.

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The Location Of Your Storage Tank

The location of your storage tank is best located above the ground, preferably as near to your glue mixer and spreader as possible. Gravity feed is the best method of transferring your resin from tank to glue mixer if your plant arrangement provides this.

Storage tanks outside should be enclosed in the colder climates. Here a small heater can be used to protect the pump and resin from freezing. In the southern, sunny climates with high heat a shed type covering from the sun is recommended to obtain maximum storage life of the glue.

The number and size of storage tanks vary with the amount of glue used and most plants suit their individual needs after discussing the glue storage plans with their adhesive technician.

to help you select the proper mortising and boring tools for fast, accurate production

Here's a handy guide you'll want for regular reference. New GREENLEE Catalog 34-M gives complete information on hollow chisels and bits, router bits, machine bits and drills, dowel bits, countersinks, plug cutters, and other high-quality tools that increase efficiency of woodworking machines.

This well-illustrated, 20-page book shows tools in detail . . . quickly gives data on sizes and types for easy selection of tools best suited to your work. Also includes tool sharpening instructions and a helpful wood screw boring chart.

If you haven't a copy, or need more copies, write today for Catalog 34-M. Greenlee Tool Co., Division of Greenlee Bros. & Co., 2137 Herbert Ave., Rockford, Illinois.

TOOLS FOR CRAFTSMEN
GREENLEE

Right or Wrong?

A roundup of day to day in-plant problems and how they were handled by management men. Each incident is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to WOOD WORKING DIGEST.

Can you fire a group of employees for gambling even though you didn't catch them red-handed?

What Happened:

Harvey Jackson, a foreman, was walking by a closed office in the corner of the plant. He heard the roll of dice, the jingling of coins and voices placing bets. He listened; and a few minutes later he went down to the superintendent's office.

"Those three are gambling again," he said.

"Same ones we caught last month?" the head man asked.

"I guess so," replied the foreman. "I didn't break in, but I heard them making bets."

"Okay, fire them," he was told.

The foreman returned to his floor and found the three men leaving the room. He stopped them, told them that he was firing them for gambling, and instructed them to pick up their pay at the cashier's window.

The men didn't say a word. They left the premises as ordered, but the next day filed a grievance. The dispute finally ended up before a 3-man arbitration board. The fired workers put up the following defense:

- The foreman did not see the men gambling.
- Although these men were caught gambling previously, they hadn't been told that they would be fired if caught again.
- The company had no "published anti-gambling" rule. Others had been caught gambling previously, and not fired.

The company's case centered around these arguments:

- Gambling is a punishable offense in all industry whether there is a written rule or not.
- Admittedly, the men were fired on circumstantial evidence but such evidence is as good in industry as it is in any court of law.
- If the men were innocent, why didn't they say so when the foreman fired them.

Was the Company: Right ☐ Wrong ☐

What The Arbitration Board Ruled:

"Previous leniency in similar cases in no way deprives the company of its inherent right to run the plant as efficiently as it can, and to discharge for just cause. If the charge of the company that these men were gambling

was not true, it is the duty of the men involved to have come forward and give an explanation of what they were doing when they were where they had no right to be. The fact that they did not do so at the time of discharge, coupled with the auditory evidence and previous pattern of behavior, sustains the company's position and contention."

Can an employer change the "starting and quitting" time without talking it over with the union?

What Happened:

The established hours in the company were 7:00 a.m. to 3:30 p.m. One day the management posted a new schedule on the bulletin board. The new hours were to be from 8:00 a.m. to 4:30 p.m. It gave the following reasons for the change.

1. The change would reduce electricity and fuel expenses.
2. It would conform better with shipping, pickups and deliveries.

The union did not take this change lightly. It pointed out that, first, there was a clause in the contract which said in part "there will be a specified starting and quitting time, and any employee working before or after the specified hours shall be paid overtime." Secondly, whatever management's reasons were, it did not have any right to change working hours without giving the union a chance to negotiate in the matter.

Was the union: Right ☐ Wrong ☐

What Arbitrator Harry Platt Ruled:

"The crucial question is whether the company, may after entering into a labor contract, unilaterally change the scheduled hours that were in effect at the time the contract was entered into. The execution of a contract does not terminate the duty to bargain on desired changes during its term. I therefore conclude that management does not have a free hand to establish new starting and quitting times without negotiating the matter with employees or their representatives. Indeed if that were not so, then the company would also have the right to unilaterally change the working hours from day to day and there would seem to be no point to the provision that 'there shall be a specified starting and quitting time.' Grievance granted."

Can you deny a promotion to a worker only because of his poor attendance record?

What Happened:

Hewitt was a good worker—with one fault. He had a poor attendance record, and often came in late. He was never seriously reprimanded for these excesses. When a higher paying job opened up, the company skipped over Hewitt, a senior man, and promoted William Young instead. In giving its reason, the company admitted that both men were good but that Hewitt's

absenteeism was the major factor in his losing out to a junior employee. Hewitt took advantage of the grievance machinery and spoke up in his own behalf:

1. Company policy called for promotion by seniority if ability and physical fitness were equal.
2. He was never told that his absences would stand in the way of a promotion.
3. It was unfair to invoke his attendance record now in view of the fact that he did his work well, as everyone agreed he did.
4. If he received the promotion he would improve his attendance.

Was Hewitt: Right ☐ Wrong ☐

What Arbitrator Jacob Blair Ruled:

"It is well established as a principle that management has the right to expect and require regular attendance on the job. While it is true that management has in this instance been extremely negligent in enforcing this right, its negligence does not bar it from applying the right in a case of promotion. To hold otherwise would, in effect, be condoning and approving absenteeism—a condition which would surely lead to even more grave problems. I deny the grievance and rule in favor of the company."

The fastest growing thing in nature is a fish—from the time a guy catches it until he tells about it.

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SAVES $30 to $50 A MONTH IN LUMBER AND LABOR
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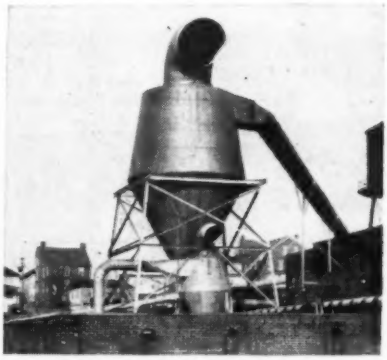

Large cyclone collector is part of Dixie Installation at Red Lion Furniture Co., Red Lion, Pa.

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● Commander MULTI-DRILLS are instantly and easily adjusted to handle any hole pattern within a 9" circle. Standard Extension Spindles will increase working area to 22½". Minimum center distances close as ½". Compact in design, ruggedly built, Commander MULTI-DRILLS are making BIG Savings in time and labor for wood-working plants everywhere. Special adaptations available.

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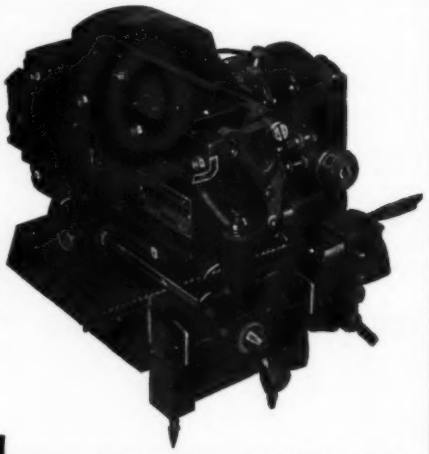
WARDWELL'S exclusive joint-set-file operation sharpens 60 teeth a minute—with absolute uniformity. Results: cleaner and faster-cutting band saws—greater efficiency by 30 to 50%. In addition, K-5 saves you the cost of a second operation.

Write for free bulletin No. K-5.



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3806 Ridge Road Cleveland 9, Ohio

New Literature

SANDING MANUAL

A new woodworking manual offering specific coated abrasive suggestions for increasing production and reducing operating costs on each wood sanding and finishing operation—from the drum sander to compounding—has been released by Minnesota Mining and Manufacturing Co., Dept. A5-149, 900 Faulquier St., St. Paul 6, Minn.

Called "The 3M System for Sanding and Finishing Wood," the illustrated booklet is divided into two major sections: "sanding wood in the white," and "wood finishing."

The first section includes information on the use of coated abrasives for drum sanding, stroke sanding, edge sanding, molding sanding and pneumatic drum sanding, as well as several miscellaneous sanding operations.

The portion of the book devoted to pneumatic drum sanding features details of converting the pneumatic drum sander to a three-in-one unit, through the use of coated abrasive belts, a contact wheel and an idler. Advantages of such a conversion include a greater abrasive working surface, the virtual elimination of wood burning, and a faster, more efficient operation, the booklet points out.

The "wood finishing" section of the publication deals with sealer sanding, scuffing, bleach coat and wash coat sanding, and points out the advantages of using a sharp, flexible sandpaper especially suited to these operations.

In addition, the section deals with lubricants, the selection of furniture compounds, and the use of 3M sander pad cover for covering hand blocks, pads and platens.

RAFTER METER

In response to an increasing number of requests for information on the various settings of a radial saw required in the preparation of roof rafters, DeWalt Inc., Lancaster, Pa., has prepared a handy dial-type meter which explains the operations involved in cutting the common roof rafter.

Although designed primarily for use with the DeWalt unit, the meter can be used in conjunction with any radial or table-type saw. It can be used to pre-determine the angles for level and plumb cuts without employing a carpenter's square. To operate, the user simply dials the circular wheel to any one of the 19 common roof pitches. Then, in a window cut-out, he reads the indicated miter settings for the desired level and plumb cuts, the length per foot of run, and the rise per foot of run for that particular pitch.

CHIPBOARD EVALUATION

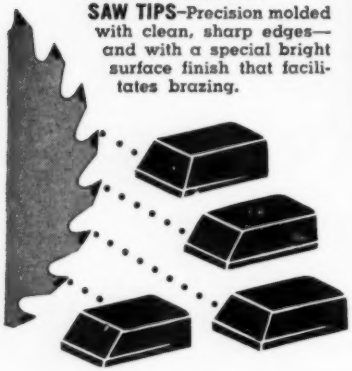
A comprehensive system of tests for determining the characteristics and performance qualities of the numerous wood particle boards, or chipboards, coming on the market, has been developed and standardized at the laboratory of Timber Engineering Company, 1319 18th St., N.W., Washington, D.C.

The new Teco evaluation system develops data in ten categories of major importance to producers and users of wood particle board material. These data are on specific gravity and weight; hardness; machineability; screw-holding capacity; bending strength; tension perpendicular to surface; dimensional stability; "telegraphing" of particles on the finish of a veneered panel; long-time load effects; and gluing ability.

Although individual tests have been performed by others in seeking data on a single property or two, the Teco system is believed to be the first overall evaluation program offered in packaged form for determining the qualifications of synthetic board materials for specific uses in product manufacture, such as furniture cores, and in construction, such as wall paneling and other interior uses.

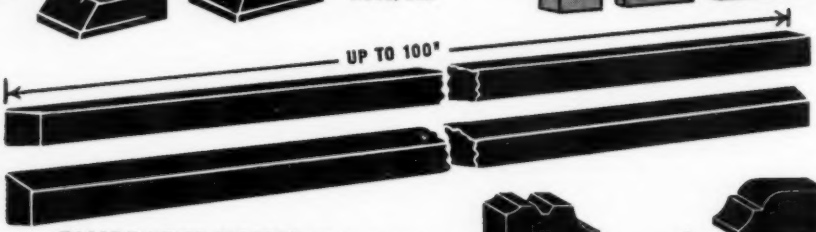
Your expression is the most important thing you wear.

TALIDE CIRCULAR SAW TIPS–Precision molded with clean, sharp edges—and with a special bright surface finish that facilitates brazing.

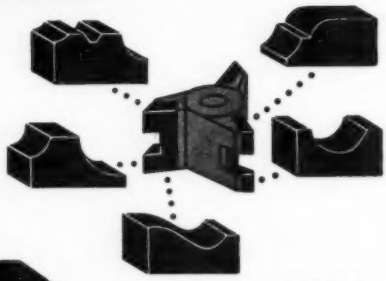


TALIDE TIPS
stay sharper · cut longer · lower costs

Available in 5 standard grades and in many sizes and shapes, for high production service on every type of woodworking operation, including the cutting of insulation board, hard board, fibres, plastics, laminated wood, etc.



TALIDE KNIFE INSERTS–Made in one solid piece (without seams or sections) and in any length up to 100"—a Talide insert assures top performance on all planer knife applications.



Metal Carbides Corporation, Youngstown 7, Ohio.

Send for Catalog 54-G

METAL CARBIDES CORPORATION
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TALIDE
YOUNGSTOWN 7, OHIO
SINTERED CARBIDES · HOT PRESSED CARBIDES
HEAVY METAL · CERMETS · HIGH TEMPERATURE ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

TALIDE ROTARY CUTTER BLANKS
Preformed to accurate tolerance with minimum stock—and to any form or shape desired.

CRAFT TENSIONED SAWS

Chicago Saws Inc., describes its line of saw blades in bulletin 110. The surfaces of Chicago saws are precision ground with special equipment for low friction operation. The bulletin illustrates and describes 9 saw blades. Good diagramatic sketches explain saw teeth with a special explanation on carbide tipped saws and their use. The firm also has dado heads, narrow band saws and special saws.

The bulletin is available from the company, Dept. WD, 6134 S. Oak Park Ave., Chicago 38, Ill.

OCTUPUS WOOD FASTENERS

These fasteners are engineered and manufactured by United-Carr. They are described in a unique 8-page folder available from the company, Dept. WD, Cambridge, Mass.

The fasteners are used in furniture

DUSTKOP
STOPS DUST

DUST
COLLECTORS

SAVES INSTALLATION TIME

Stop dust quickly, at lower cost, with Dustkop. Thirty-seven standard models *ready to use* and available from stock. Dustkop conserves floor space, reduces maintenance. Collects almost all types of industrial dusts. Write for descriptive literature.

Also a complete line of Mist Collectors

AGET MANUFACTURING COMPANY
1382 East Church St. • Adrian, Michigan

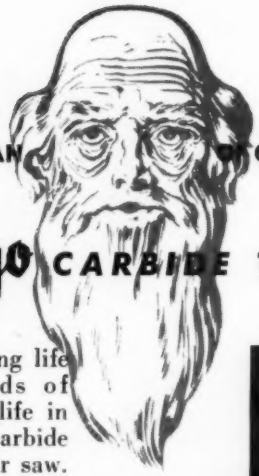
manufacturing, such as case goods, occasional tables, etc. Octupus fasteners provide metal-to-metal threads and a large bearing area, to overcome typical problems encountered in the use of metal-to-wood threads. They can be used equally well in the end grain.

KD and do-it-yourself items are increasing in popularity. The manufacturer says that use of Octupus fasteners by manufacturers means that the customer can put items together with a "twist of the wrist."

PATTERN MAKERS' MACHINE

The Glover core box and fillet machine is now available from the firm at 734 Mohican Place, Meadville, Pa. This machine can be used like a jointer for straight concave cuts. Elbows and rings are pivoted from a ⅜" drilled hole. Irregular shapes—by holding the outside contour against the fence and irregular contours can be made by cutting to an end layout.

The manufacturer has a 4-page bro-



THE METHUSELAH OF CIRCULAR SAWS

Chicago CARBIDE TIPPED

Not just a long life but hundreds of times longer life in a Chicago carbide tipped circular saw. Your customer will be convinced of the performance dividends these saws will pay them. Write for catalog and price list showing complete line of plain and carbide tipped saws.

THE QUALITY LINE FOR OVER THIRTY YEARS

A full line of carbide tipped blades including: Rip, Cutoff, Combination, 8-tooth Power Saw, and Planer in standard gauges and sizes.

Chicago Saws INC.

CHICAGO SAW WORKS, INC.
6130 Oak Park Ave. Chicago 38, Ill.

chure illustrating the machine and setups for particular cuts. The machine has a cutting range from 11/16" to 6½". Maximum cutting depth, 5/16" beyond center. The machine should be helpful to any pattern making shop for use on hard or soft wood.

STEEL STRAPPING

United States Steel's Gerrard Steel Strapping Division, has completed a new brochure illustrating its line of heavy duty flat steel strapping equipment and accessory items.

The brochure contains photographs showing the application of this equipment. Heavy duty flat steel strapping is used for carloading, truckloading, palletizing and unit reinforcement.

Free copies are available by writing to Gerrard Steel Strapping Division, 2915 West 47th Street, Chicago 32, Ill.

NEW

Onsrud SOLID CARBIDE TIPPED

TRUE *Spiral* SHAPING CUTTERS

Spiral cutters are frequently indicated where thickness (length) of cutting edge is extreme . . . over 50% of diameter, and where stock is loose or fibrous grained.

Onsrud Carbide Tipped Spiral Shaping cutters are true spirals, 20% helix, with same rake and clearance throughout their length. Their shearing action feeds and cuts smoothly.

Carbide tipped blades, brazed to precision machined dynamically balanced bodies, hold sharp cutting edges up to 10 times longer than H.S. steel . . . REDUCE COSTS because they last longer and require less resharpening. Ideal for intensive, continuous production in hard woods. Also for plastics and non ferrous metals.

Each cutter is specially engineered for the requirements of your particular application. Write for prices and descriptive bulletin.

Onsrud Cutter Manufacturing Co.

801-21 E. Broadway, Libertyville, Ill.

WELDWOOD CATALOG

The 1955 edition of The Weldwood Catalog has just been issued by United States Plywood Corporation, 55 W. 44th St., New York City, featuring 105 products in a wide range of sizes and thicknesses.

The catalog, done in color and profusely illustrated, constitutes a useful handbook.

A.W.I. RELEASES BROCHURE

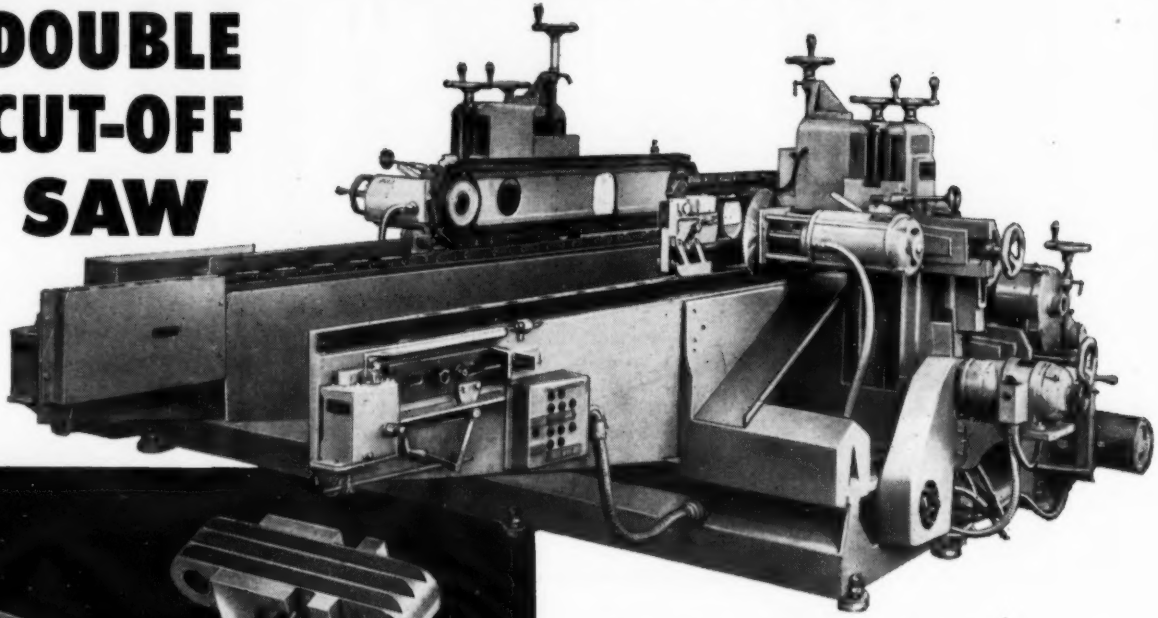
The Architectural Woodwork Institute, 332 S. Michigan, Chicago, has mailed brochure number 6 "Cabinet Construction Data" to over 10,000 architects throughout the United States and Canada.

Presented in the brochure is an outstanding group of details of custom designed cabinet and casework chosen from various issues of "Progressive Architecture." Also included in the 20-

All Welded Steel Construction

on the MEREEN-JOHNSON NO. 300

DOUBLE CUT-OFF SAW



The No. 300 is offered to meet varying working conditions. It can be equipped with regular or high speed cope motors, stationary or

with the MULTI-V CHAIN

This special chain is furnished on the M-J No. 300. Note the 45° angle of the three V grooves to prevent sideways movement. The inverted center link clearly illustrates the full length bearing surface in both horizontal and vertical planes. There is approximately 55% greater horizontal and 95% more vertical bearing area than with low angle single V-chain. Patented snap dogs are standard equipment.

varying working conditions. It can be equipped with regular or high speed cope motors, stationary or jump dado arbor or other accessories as required. The sturdy, welded steel construction . . . rubber block hold-downs . . . snap-on feed dogs . . . and variable feed drive are only a few of its outstanding features.

Write for the No. 300 Bulletin

MEREEN-JOHNSON MACHINE CO.

4401 LYNDALE AVE. NO. • MINNEAPOLIS 12, MINNESOTA

CUT-OFF SAWS | DOUBLE CUT-OFF SAWS | MULTIPLE CUT-OFF SAWS | GANG RIP SAWS

TENONERS | VENEER & PLYWOOD SIZERS & JOINTERS | RESAWS

can you too cut costs with
UPSON WOOD FIBER
pieces and cut-outs?

Many businesses are effecting huge savings right now. Often, inexpensive Upson Wood Fiber products can do a better job than more expensive materials. 1001 uses.

Card Table Tops, Backs, Dust Bottoms
Upson's cutting equipment is perfect for the furniture industry. Panels paint easily, are super strong!

Die Cut Gaskets of all types
Upson available many thicknesses. Chances are, one meets your needs. Long experience cutting to close tolerances offers savings.

Panel Protectors for your product
Let strong Upson Panels take bumps, scratches. Your product arrives in top condition. Use in materials handling.

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PROVEN QUALITY YOU CAN TRUST

FREE SAMPLES
MAIL COUPON

45th Year

UPSON
The Upson Company
9127 Upson Point, Lockport, N. Y.
Please Rush free sample kit.

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ADDRESS_____
CITY_____ STATE_____

page brochure is an outline of the exclusive features that architects get when they specify custom designed cabinet work.

AIR TACKER BROCHURE

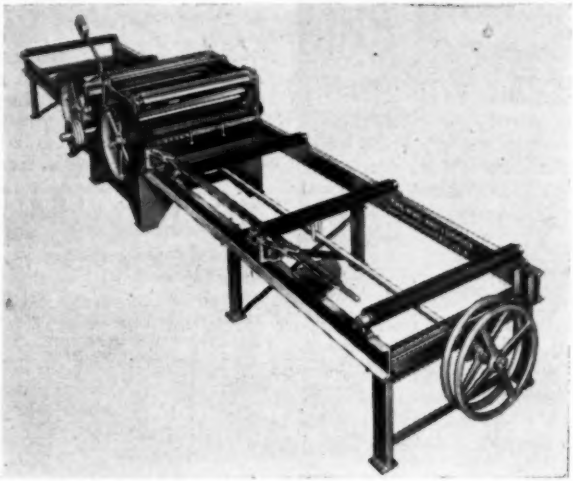
Fastener Corporation, Chicago 14, has just released a new 4-page brochure on its Duo-Fast direct drive air tackers. It includes eleven action pictures, a description of the various models available, a story on the staples used, and illustrations of the various attachments for these machines. This brochure is available on request.

HYDRAULIC EQUIPMENT

A new twelve-page, two color, profusely illustrated 8½ x 11 catalog describing oil-hydraulic equipment for application on machinery for logging, lumber and plywood is now available from Vickers Incorporated, Dept. WD, 1400 Oakman Blvd., Detroit 32, Mich.

EQUIPMENT and Supplies for the WOODWORKING INDUSTRY

WHELAND EDGER



A new medium duty Edger, No. E-42, 4" x 42", is now available from the Wheland Company, Signal Mountain Rd., Chattanooga, Tenn.

The new E-42 edger is all fabricated steel, designed for either wheel or lever shift. Mills of 20,000 to 40,000 foot daily capacity find it well-suited for their needs.

One of the outstanding advantages of the E-42 edger is the fact that saws can be changed easily. The specially constructed end bearing assembly can be removed completely without disturbing bearing adjustment. Other construction features include: (1) Free-running turned and polished steel saw arbor with self-aligning ball bearings; (2) End bearing assembly removable as a complete unit, permitting saws to be changed easily and quickly without disturbing bearing adjustment; (3) Ball bearing table rolls; (4) Four fluted steel feed rolls with self-aligning ball bearings. Renewable saw tooth feed rolls are available at slight additional cost.

DRILLING AND ROUTING MACHINE

A new machine developed for the door manufacturer and millwork shop is now on the market and in operation, announces the Knight Machinery Co., manufacturers of this machine. The machine drills all the holes for the locks and routs out the areas for the hinges on doors and jambs.

Simple adjustments are made to change the hand for door swing. All drilling is done by foot levers. Routing

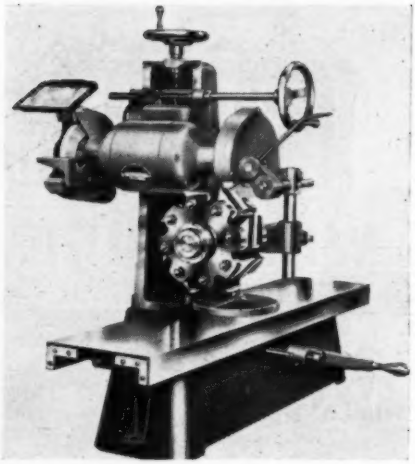
action, vertical and horizontal motion on sealed ball bearings. All measurements are set with the utmost accuracy. Single phase current is used for all power supply.

The machine is so designed that it can be operated with one man or three, depending on the speed needed.

For further information and literature, write Knight Machinery Co., Dept. WD, 2211-23rd. Ave. S., Seattle 44, Wash.

NEWMAN GRINDER

The GO71 bench type head grinder is designed to grind many types and sizes of molder heads, matcher side heads and profiler heads. The ¾ h.p., 3600 rpm., double spindle ball bearing motor is mounted on slides 12" long x 10" wide which slide on dovetail ways made integral with the column.



An outstanding feature of the machine is the cast iron guards which completely enclose the wheels and thereby give maximum protection to the operator. The table is 35" long x 9" wide and has a horizontal travel of 25". The table is provided with wipers to protect the sliding surfaces from dust and dirt.

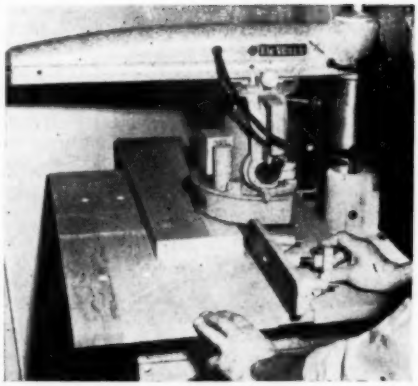
Maximum cutterhead swing is 11". The grinder will take 6" long profiler and molder slip-on heads. A universal type stop finger is provided for holding the heads in proper position for accurate grinding of the knives.

Complete information is available from the Newman Machine Co., Inc., Greensboro, N.C.

NEW SHAPER-JOINTER FENCE

DeWalt Inc., Lancaster, Pa., has introduced a new style jointer-shaper fence used to convert the "Power Shop" machine—basically a radial arm circular saw—into a highly effective jointer or shaper.

The new fence replaces the standard wood guide of the "Power Shop" when the machine is to be used for shaping or jointing. Then, with the motor in vertical position, and a shaper or jointer head attached to the spindle, the material to be processed is fed along the

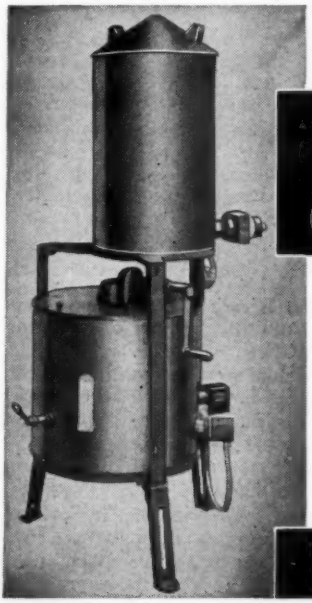


fence and through the cutting knives. The height of the fence acts as a safety guard in protecting the operator from the moving parts of the machine which are positioned behind it. Secondly, the long, rigid fence is supported at both ends, eliminating the possibility of "whip" sometimes present in conventional jointers which have only one point of support. Third, because the fence fits into the wood table top of the "Power Shop" (with a work surface 13″ x 32″) the "bed" or bearing surface for the stock is more than adequate.

ELECTRIC CLOCK MOTOR

The William L. Gilbert Clock Corp., Winsted, Conn., developed a new electric motor that will enable the production of a similar less expensive electric clock than it has heretofore been possible to produce.

The motor operates on 1¼ watts, 60 cycle alternating current and uses about half the current of a conventional motor. By using the repulsion effect of electricity on a permanent magnet, loss of power resulting from the use of shading coils has been eliminated and the size reduced to 1/3 of any other conventional motor. The motor starts quickly and synchronizes immediately at 720 rpm. It is designed in such a way that it will only operate synchronously. An ingenious device insures the motor's running only in the proper direction.



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ZIMMERMAN
PROCESS
GLUE FILTERING CONVERTER

Saves Up To 35% In Costs • Quality Maintained 100%

You always have the exact amount needed without any waiting, dilution or evaporation . . . always uniform consistency. Today send for the full story on the first machine to really preserve ALL the quality of fresh animal glue . . . the ZIMMERMAN CONVERTER featuring Automatic Temperature Control . . . available in steam or electric models.

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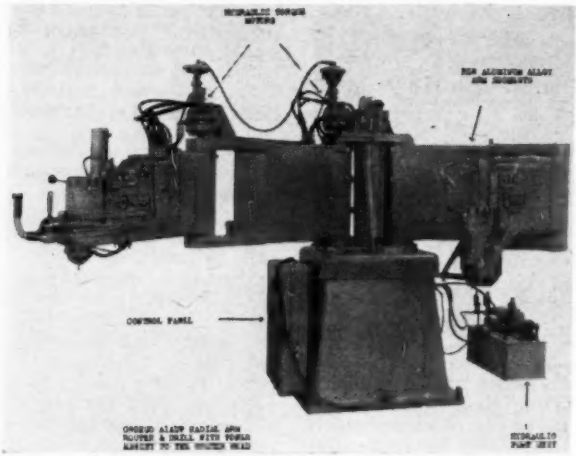
INSTANTANEOUS GLUE CONVERTER COMPANY
2217 IOWA AVENUE, CINCINNATI 6, OHIO

POWER ASSIST FOR ROUTERS



The conventional radial arm router has proven quite satisfactory for most machining operations of wood and non-ferrous metals, when this material does not exceed 5/8" in thickness. However, when this thickness is exceeded, the manual operation of the router becomes an arduous task. The cutter motor is over taxed and the operator overworked. Onsrud, therefore, has incorporated a power feed mechanism into their radial arm routers which is referred to as Onsrud Power Assist.

The power assist works on the principle of applying motivating power in the direction required by the operator. The power assist is operated at the operator's will; he merely moves the lever in the direction he wishes the router to move and the arm segments re-act accordingly. For light work, corners, etc., the power assist is not used.

The principle of the entire system, is the use of hydraulic motors at each pivot point, controlled by a hydraulic valve which controls the rotation of the pivot shafts in the direction selected by the operator. The control always returns to normal as soon as the operator releases the lever. The operator, however, keeps the head in contact with the form bar at all times. This is principally the difference between a power feed machine and a power assist machine.

WATERPROOF ABRASIVE MESH

A mesh-type waterproof coated abrasive product resistant to filling and loading has been added to its line of industrial sandpapers, according to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Called "Wetordry Fabricut," the material is composed of a cloth mesh coated on both sides with mineral grains bonded to the cloth with a heat-resistant, waterproof resin.

The product is available coated with aluminum oxide or silicon carbide mineral; and it can be used for either wet or dry sanding, by hand or machine, the 3M Company said.

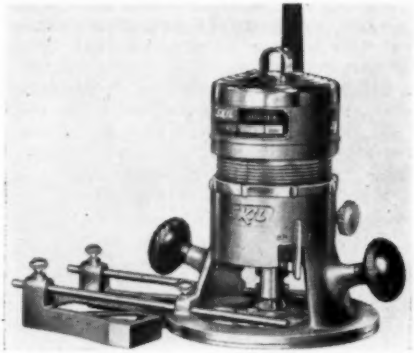
"Fabricut" has a "self-cleaning" action which minimizes filling as the stock being removed passes through the openings in the mesh. If the mesh does become clogged, it can be blown clean with compressed air.

The material is available in coarse to fine grits, ranging from 100 to 400. Roll sizes run up to 2½" in width; disc sizes include up to 18" diameter; and

standard sheet sizes are 9" x 11", 3" x 8" and 3" x 3-2/3" x 9". "Fabricut" is also available in other sheet sizes on request.

SKIL ROUTER

Skil Corporation, 5033 N. Elston Ave., Chicago, Ill., has added to its line a portable electric router, Model 299, which is rated at 1¼ h.p. and has a free cutting speed of 23,000 r.p.m.



Skil recommends the tool for grooving, dadoing, beading, rabbeting, mortising, veining, cove cutting and for a wide range of decorative cutting.

An exclusive feature of the router is a new type control switch, which can be conveniently operated without removing hands from guide handles. The router has a precise cutting-depth adjustment with positive locking control.

Accessories are collets for ¼", 5/16", ⅜" and ½" bit shanks, router bits and template guides.

LATHE ATTACHMENT

The centerless profile-tracer lathe attachment is an adaptation for the woodworking industry of a similar lathe attachment which the company has been making for the metalworking industry for a number of years. The Turnomat Co., Inc., Brockport 46, N.Y., is the manufacturer.

more eased-edge lumber at less cost with DISSTON PHILBRICK® CUTTER HEADS and KNIVES

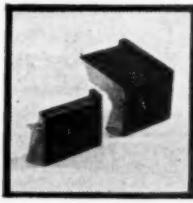
Sounds unbelievable, doesn't it? Yet, that's the production record of one set of Disston knives—thanks to the superior edge-holding qualities of Disston steel. Disston knife design allows free discharge of chips—eliminates over-loading and clogging—makes possible maximum feeds.

Why not capitalize on the tremendous demand for eased-edge lumber by using low-cost, high-production Disston Philbrick Generated Type cutter heads and Disston knives in your plant. Order them from your Disston distributor, or write:

HENRY DISSTON & SONS, INC.
795 Tacony, Phila. 35, Pa.

Other factories and branches:
Seattle, Wash.; Chicago, Ill.; Toronto, Ont.

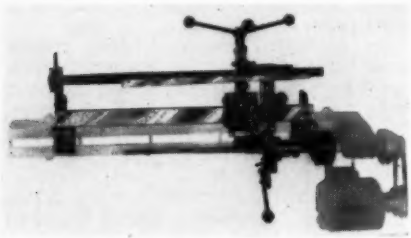
36 million feet of stock from one set of knives!



Long-Life Disston Knives Cut Costs

Notice the new and worn-out knives at left and how the latter retains its pattern and wears right down to the end.

Specifically, it is claimed that the unit performs centerless turning, precision duplicating, facing, fluting and reeding operations. The unit can be attached to



any standard make or model of wood lathe with the aid of two bolts. Stock up to 1¾" round or 1-7/32" square, in unlimited lengths, can be turned to diameters of 1/32".

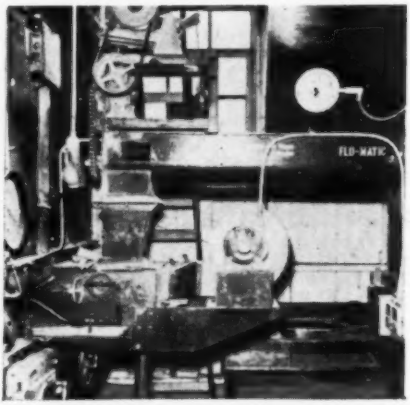
The chief advantage of the unit in lowering production costs is its ability to duplicate any number of pieces with extreme precision. This is accomplished with the aid of the profile-tracer and templates which are cut from blank aluminum stock with ordinary household shears. Patterns of the most intricate design can be cut with ease by the most inexperienced worker. Once a template has been cut, it is bolted to the unit and the tracing mechanism duplicates the exact pattern on the stock. After use, the template can be stored and reused any number of times. Viewed from above, as illustrated, the relation of the template to the stock can be readily seen.

"It is much more important to be human than to be important."

WOOD REFUSE STOKER

A new low-cost industrial wood refuse fuel stoker is now being manufactured by the American Coal Burner and Wood Stoker Corporation, 18 E. Erie St., Chicago, Ill. The new stoker (Model ZD-56) is a modified version of the Fyr-Feeder air-jet stoker.

This stoker can be applied thru the front of an existing boiler and arranged to extract and measure fuel from a storage bin, or it can be equipped with a transfer hopper to receive fuel from present conveyor or blow pipe system. It efficiently burns wet or dry hogged wood, planer shavings, chips, bark, etc. Fuel is metered to suit steam requirements and then mixed with proportioned air in a carburetor-distributor and spray-spread on the grate.

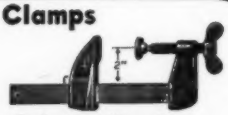


The Fyr-Feeder Model ZD-56 is available for use in industrial plants operating boilers 60 HP and larger.

HARTFORD CLAMPS
Since 1915

Single Bar Clamps

Style No. 16, adjustable head piece only



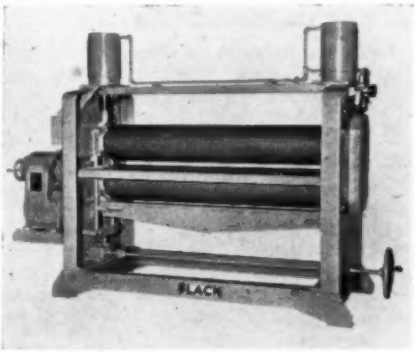
Style No. 17, adjustable tail piece only

Quick adjusting, self-locking and unlocking . . . both styles tested for safe clamping strain of 1800 lbs.

HARTFORD CLAMP COMPANY • EAST HARTFORD, CONN.

ROTARY PRESS

The rotary or combining press is steadily gaining in popularity among users of synthetic pressure type adhesives in the manufacture of table tops, sink tops, service bars and similar construction where a quick bond is desirable and it becomes advantageous to utilize structural features of dissimilar materials to achieve balanced or sandwich-like laminations. Such materials include: asbestos-cement board, phenolic and polyester laminate, fibre board, plywood, aluminum, stainless steel and many others.



The press consists of a set of equal diameter power driven rolls between which the laminate is passed under pressure to form a strong bond between the component parts. The Black Brothers press is equipped with 56" rubber covered rolls of sufficient hardness to insure positive lamination without marring or scratching material. These rolls are 8¾" O.D. The upper roll is adjustable from 0" to 4½" vertically with respect to the lower roll. Air cylinders are used to achieve 7500 lbs. of combining pressure. The variable speed motor allows pressing speeds from 10 to 60 FPM.

The rotary press is made in regular production models in roll widths of: 26", 32", 38", 44", 50", 56", and 62". These are the standard sizes. Similar widths from 8" to 26" are available as well as intermediate sizes. Order from Black Brothers Co., Dept. WD, Mendota, Ill.

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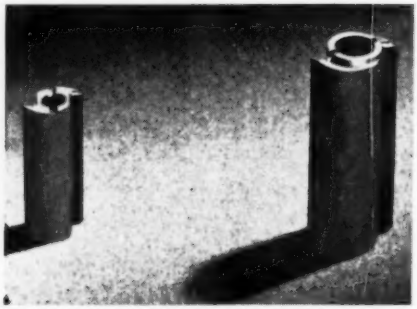
PLANE BLADES AVAILABLE

Expansion of the nationally distributed O.C.E. line of carbide-tipped woodworking tools to include straight-fluted plane blades is the newest development reported by the manufacturer's exclusive distributors, Price & Rutzebeck, 22150 Meekland Ave., Hayward, Calif.

Blades are in two sizes: 13/16" diameter, to fit small Porter-Cable and Stanley planes, and 1-5/32" diameter for the large Porter Cable model. Carbide models are particularly well adapted to production run trimming of plywood and masonite doors.

O.C.E. (Oakland Carbide Engineering) claims a competitive edge for its carbide-tipped tools—which also include router bits, door lip cutters and plastic trimmers—in methods of preparing seat for the tips and of brazing carbide onto the seat. A distinctive copper colored finish distinguishes all its products.



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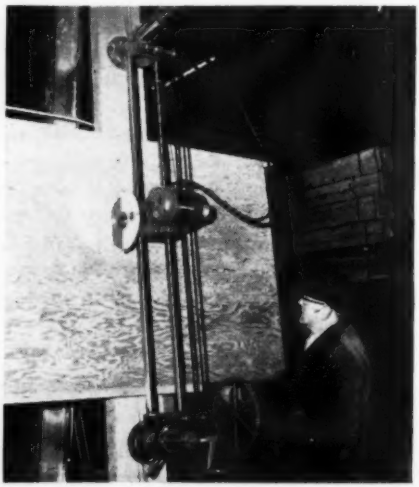
LONG-RAIL PANEL SAW

Designed to make it easy to cut plywood and other sheet materials to specifications Hendrick Mfg. Corp., Marblehead, Mass., has designed a long-rail panel saw.

Mounted on a rigid rail arm, the MLR saw carriage is drawn through the stock by a simple chain and sprocket drive. The operator turns a handwheel and has a positive feel of the cutting action. He can advance or back off the saw with precision control. Cuts are effortlessly made at rates up to 75 feet per minute.

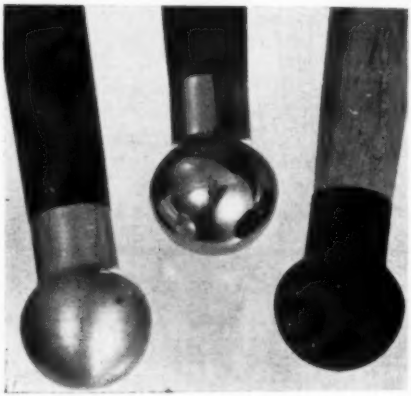
The Line Lumber Co., Malden, Mass., has ingeniously mounted the MLR saw in a vertical position. This installation takes up a minimum of space and makes it possible to cut plastic panels, hardboards and plywood.



Used in its conventional horizontal position, Martin Lumber Co., Springfield, Mass., uses the MLR saw to trim plastic laminate countertops.

BRASS BALL FERRULES

A unique and revoluticnary process for manufacturing quality all-brass ball ferrules was recently developed and announced by Tubing Seal Cap, Inc. of 808 West Santa Anita, San Gabriel, California.



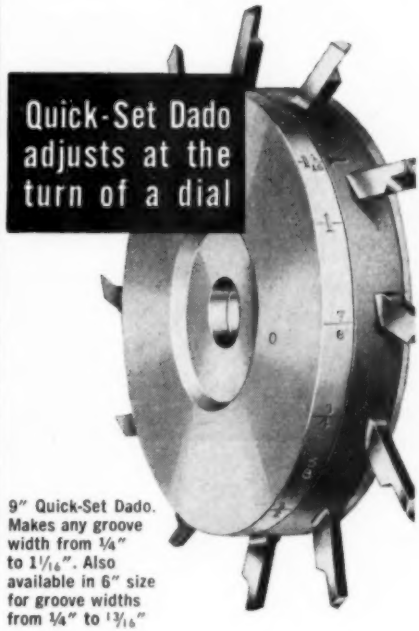
To introduce the line, Tubing Seal Cap, Inc. is offering representative samples plus price and quantity structures in answer to inquiries from manufacturers and designers of furniture and related products.

NEW HANDLES FOR CLAMPS

New red-vinyl-plastic Safety-Ease Handle Grips—created to lessen worker fatigue and to provide greater safety and ease to operators' hands—are now standard equipment on almost all models of De-Sta-Co toggle clamps.

These Safety-Ease Handle Grips are an exclusive feature of De-Sta-Co toggle clamps, which are manufactured by Detroit Stamping Co., Detroit 3, Mich.

Dial the Dado Cut You Need



9" Quick-Set Dado. Makes any groove width from ¼" to 1 1/16". Also available in 6" size for groove widths from ¼" to 1 3/16"

...Adjustable without removing tool from arbor

...Stays sharp 4 to 5 times longer than conventional dado blades

Now you can adjust to the groove width you need simply by turning a dial and *without removing the dado from the arbor!* 8 high-speed tool steel blades, silver brazed in interlocking steel and aluminum side plates, cut cleaner and stay sharper far longer than any conventional dado.

The Quick-Set Dado is adaptable for either right or left hand application and is available for shaft sizes from ½" to 1".

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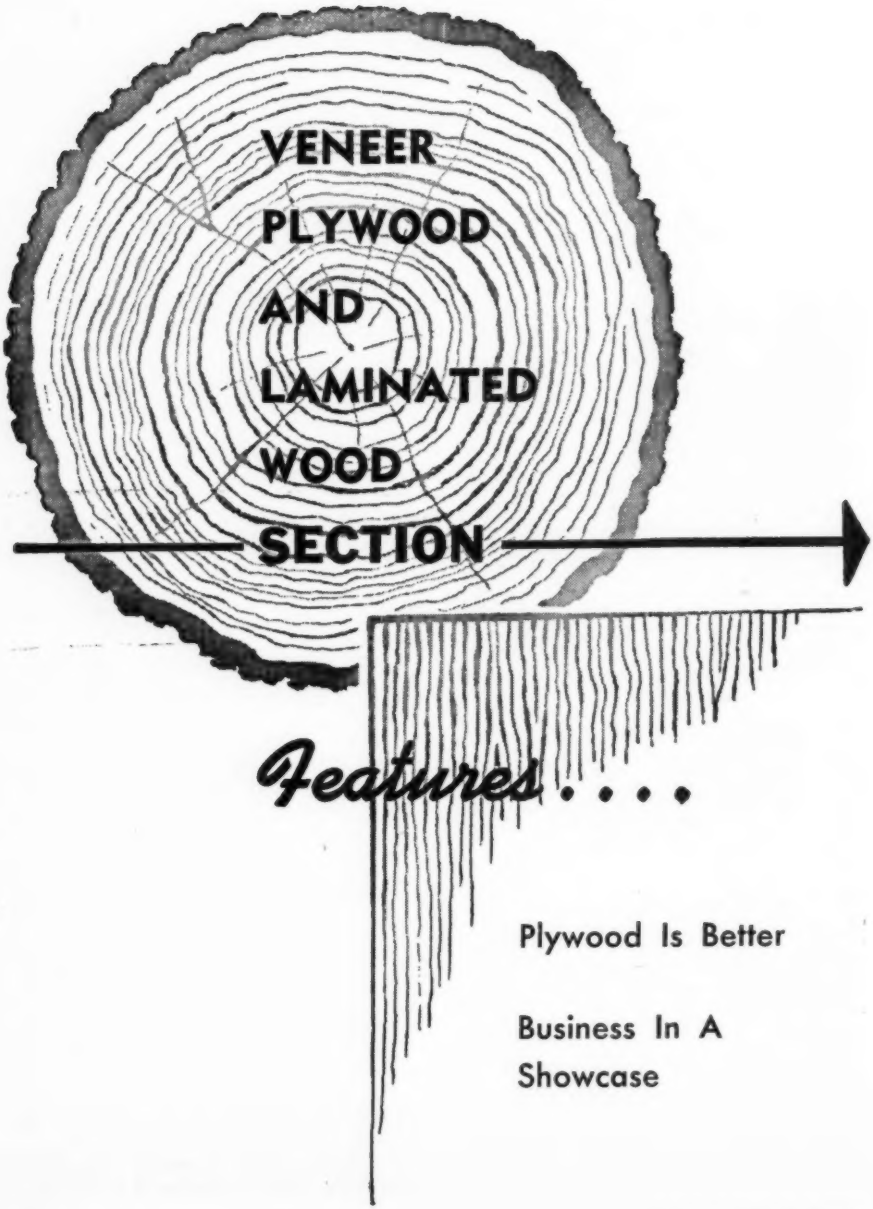
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PLYWOOD

Is Better.... Compound Curves

By **Thomas D. Perry**

THE previous article in this series, "Plywood Has Flexibility," in the May 1955 issue of WOOD WORKING DIGEST, covered only one major type of plywood-flexibility, i.e., that of bending or curving flat plywood, or of curving plywood during the gluing process, using pairs of rigid dies. In either instance the plywood was bent in simple curvature (in one plane or direction only), as in the case of a segment of a cylindrical drum or of a round tube. This simple curving can be done with standard glues or adhesives hardened at room temperatures (cold bonding), or with resin adhesives cured under heat. The amount of special equipment required is usually rather limited, and this simple curvature is a more or less general procedure in many plywood plants.

In contrast with the above, compound curves, in two planes or in several directions, as in a globe or a boat hull, represent quite a different type of curved plywood and require special techniques. From a practical point of view, such compound curving must be done during the gluing process, employing heat for the double purpose of making the veneer more ductile and of curing the adhesive (usually some type of synthetic resin) at the same time and under the same heat application. These procedures require highly specialized equipment and are only employed where the extra cost is justified.

There are two principal methods for making compound curvature in plywood, depending on the extent of curvature required, viz.:

Formed Plywood: in which veneers are pressed between pairs of rigid forms under heat during the gluing process. This may involve the stretching of the wood fibres and must not extend beyond the point of rupture. The familiar "Bentwood" or "Toastmaster" trays, with raised rims, are examples, and the depressed or protruding corners are examples of compound curvature. Since this forming is done under heat, and with rigid dies, high pressures can be used and the wood compressed to a significant extent.

Molded Plywood: in which the veneers are tailored to such shapes as to fit on or in a rigid half mold and are temporarily fastened in position. The flexible, or omni-directional, pressure is exerted by a flexible rubber bag or cushion, which serves as the other half of the mold. An illustration of such tailored shapes would be the double pointed segments of an orange peel as they are removed. Since the maximum pressures that are attainable in flexible bags seldom exceed 50 to 100 lbs. p.s.i., there is no significant compression of the wood. Heat is re-

Fig. 1. Toastmaster tray, by Overton.

quired to cure the synthetic resin adhesives and develop ductility in the wood. Either autoclaves or metal dies with bolted cap pieces are required to concentrate the pressure on the plywood.

It should be noted that either the pairs of heated metal dies or flexible pressure are among the devices that can be used, also, in simple curvature, but they are mandatory in compound curvature.

Formed Plywood

The best known example of formed plywood is the serving tray, made in many shapes and sizes by Overton, Camfield and Haskelite, which have been popular for many years. Such trays are illustrated in Fig. 1 and 2, the latter being mounted on legs to serve as a coffee table. These trays are usually of a 5-ply construction, a trifle over ⅛" thick. The assembling of the veneers into the tray is quite different from that of standard flat plywood and deserves a brief outline. The face veneers are unusually thin, 1/40" to 1/50", and are 2-plied with cross bands, also very thin, 1/30" to 1/40". Tego, a phenolic film, is the usual adhesive in this preliminary gluing step, since its tendency to "strike through" is reduced to a minimum. This first gluing is flat and both faces and backs are sanded to a finish smoothness in the flat. These 2-plies are thin enough to be pliable, and are readily sanded on a belt sander. Adequate sanding after forming would be difficult and costly. This 2-ply reinforcement adds distinct toughness to the outer veneers and permits the stretching or compression of the wood at the corners without rupturing the fibres. Single plies, without such cross laid backings, would tend to split, sliver and over-lap at the corners and edges. This 2-plying also serves to anchor, firmly, any decorative inlays, adds strength to any edge joints, and decreases the brittleness of highly figured face veneers.

Fig. 2. Coffee table with tray top, by Camfield.

The next operation is that of assembling these 2-ply faces and backs on the cores or central veneer layers, again using the film type of resin adhesives. A needle point steam spray is used to wet the veneer cores, 1/10" or 1/12" thick, in the area where the bends are to occur, in order to reduce possible splitting. This moistening follows the contour of the depression in the tray, and is usually in bands about 1" plus wide. This steaming is the main reason for preferring the film type of adhesive, since any liquid adhesive would be unduly diluted in the wetted area, where a strong bond is most important.

The actual forming is in the second gluing operation, and is carried out

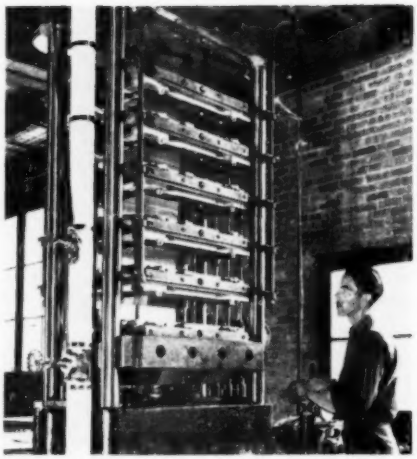

Fig. 3. Multiple hot press for forming dies.

in a multiple opening hot press, such as is illustrated in Fig. 3. The normal steam heated platens of this press are flat. The pairs of metal forming dies are bolted to them in each opening, and are adequately heated by contact with the press platens. Several shapes of trays can be made in adjacent openings if they are of approximately the same size. Slip latches are supplied in the upper form to lift the finished tray free from the bottom form, and thus facilitate easy removal.

Molded Plywood

The technique of making molded plywood differs from that of formed plywood by employing one rigid die, the mating die being flexible, and of some such material as rubber, which can be inflated or deflated, as the case may require.

A well known example of this type of curved plywood is the small boat hull, usually molded in one integral piece of plywcod, although it is often desirable to make the transom, or stern board, of solid lumber of sufficient thickness for the attachment of an outboard motor. The gunwales, keel, deck and trimmings are usually attached

(Continued on page 130.)

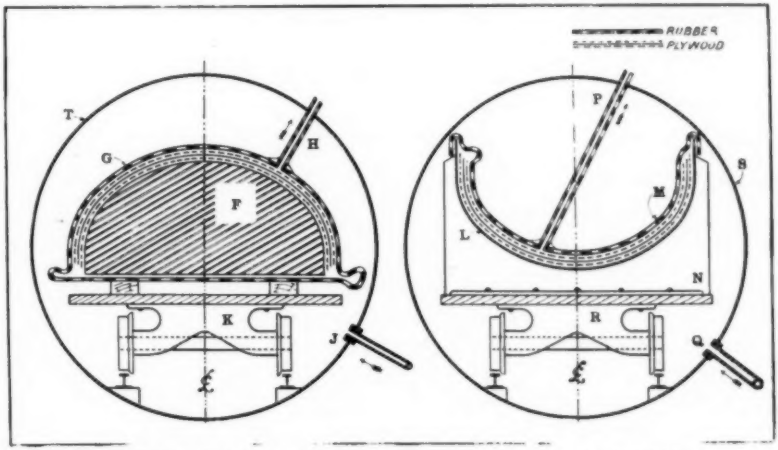

Fig. 4. Cross sectional sketch of bag molding in autoclave. Left: deflated bag on solid concave mold in autoclave. F. solid concave mold, usually of wood. G. deflated rubber bag, clamped shut. H. vacuum or vent connections. J. fluid inlet, usually steam, to produce pressure in autoclave. K. transfer car. T. autoclave. Right: deflated half bag, on concave shell mold, in autoclave. L. shell mold of metal, concave. M. half bag, to be deflated. N. cross frames to keep mold, L, rigid. P. vacuum or vent connections. Q. fluid inlet, usually steam, to produce pressure in autoclave. R. transfer car. S. autoclave.

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BARREL HANDLING TRUCK

A new barrel handling truck, which is said to require no tipping or pick-up space when handling barrels touching each other, has just been announced by Valley Craft Products, Inc., 760 Jefferson Avenue, Lake City, Minnesota.

Designated "Valley Barrel Cart Model 600," the manufacturer says it is equipped with an automatic spring actuated bar that allows a hook to slip over the barrel edge as the truck is moved against the barrel without the operator touching either the hook or barrel.

Heavy barrels stored in contact with each other can be easily loaded on the truck by a single operator without moving them apart because of this automatic clamping hook. Special design of the loading shoes provides easy tipping of the heaviest barrels.

SLIDING DOOR HARDWARE

Grant Pulley & Hardware Corporation, 31-85 Whitestone Parkway, Flushing 54, New York, announces a new line of sliding door hardware, known as the "Giant."

Eight complete packaged sets are available; top mount adjustable and non-adjustable hangers; side mount adjustable hangers for one door; and side mount adjustable hangers for two by-passing doors. Non-corrosive aluminum track is packaged with all complete sets.

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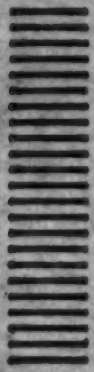

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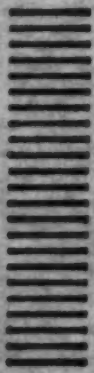

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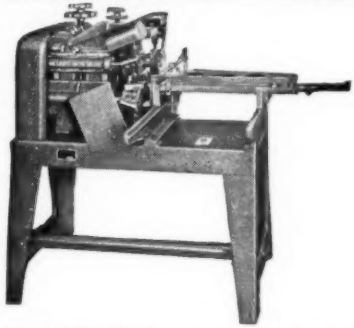

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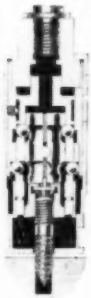

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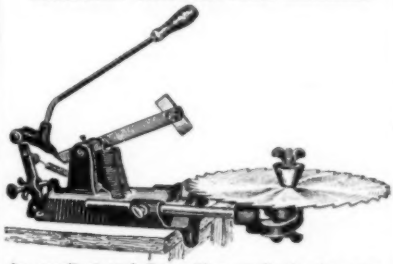

An excellent tool for setting small circular saws. The successful operation of all circular saws depends largely upon the manner in which they are fitted.

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Adjustable for saws, either rip or cut-off, from 5" to 24" in diameter.

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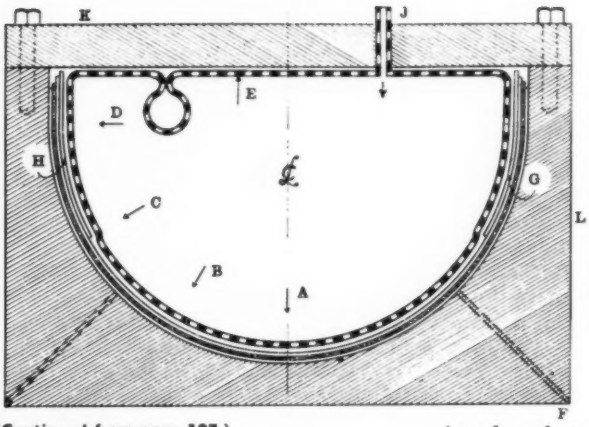


Fig. 5. Cross sectional sketch of bag molding, without autoclave. A, B, C, D, arrows indicate omni-directional pressure. E. internal flexible rubber bag. F. drain, for air or condensation. G, H. reinforcing veneer layer to increase thickness. J. pressure inlet. K. cap, to be bolted tight. L. metal mold, self contained.

(Continued from page 127.)

to the plywood after removing the ragged edges and sanding. Sometimes, when production is large enough to justify it, the keel and gunwales are molded in with the hull.

A mold for the hull of a boat is usually convex, made of laminated lumber, so that the tailored veneer strips can be stapled in place temporarily until the resin adhesive has been cured. The long strips of veneer are precoated with a phenolic resin and dried for easy handling. After gluing these veneer strips are tailor cut according to templates, which have been prefitted on the mold. They are designed so that the joints will be reasonably tight for any given shape of hull. These strips are usually laid in alternately slanting directions, and are tacked in place temporarily. This mold with its attached veneer assembly is then placed in an open end rubber bag, after which the open end is clamped shut. This bag and its contents is then mounted on a truck or dolly car, so that it can be pushed into an autoclave for the application of final pressure and the curing of the adhesive bond.

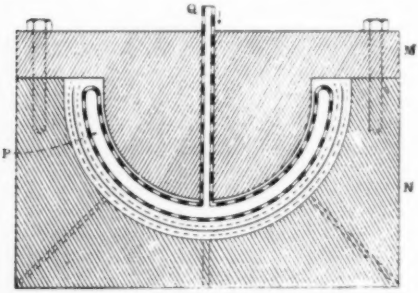


Fig. 6. Sketch of cushion bag molding, without autoclave. M. cap that can be bolted tight. N. lower half of concave die. P. thin rubber bag, or cushion. Q. steam inlet.

The essential working details of this technique are more clearly shown in the cross section sketch of Fig. 4. The left hand drawing indicates the use of a convex mold, and the right hand a concave mold, which is seldom used, but is shown for comparison. As a matter of practice, the bag, G, is placed on the transfer car, K, and its upper side pulled back and out of the way. Then the mold is placed on the lower side of the bag, and the veneers (dotted lines) are assembled.

After a careful inspection of the completed layup, the upper side of the bag is drawn over the assembled veneer and its mouth clamped shut, which is not shown. The air within the bag is exhausted by the vacuum

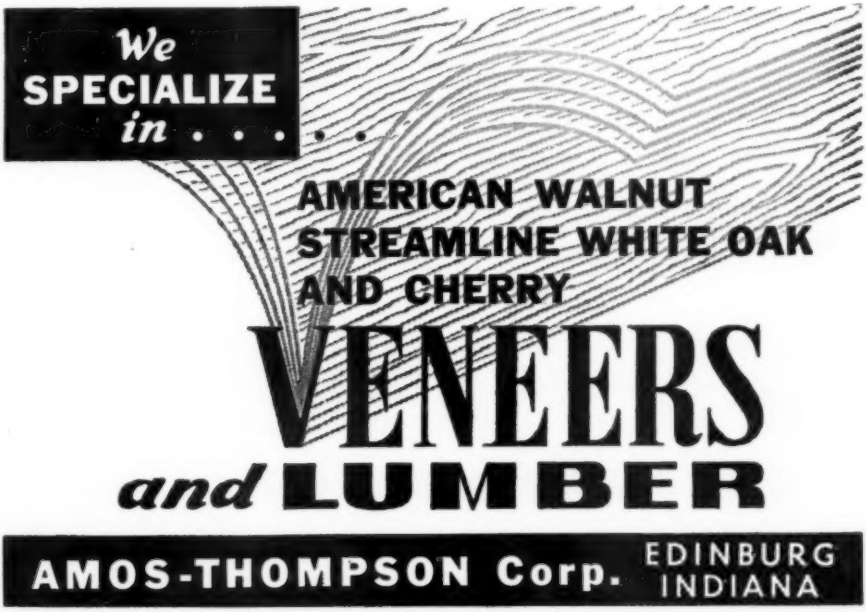
pump attached to the tube, H. During this process another careful examination is made to be sure that the pressure (12 to 15 lbs. of vacuum) has pushed all of the veneers down into their proper place. A rubber hammer is used on any spots where there appears to be a gap between the veneer layers. Any folds in the veneer should be avoided as far as possible.

The transfer car, with its load, is then pushed into the open autoclave, and the door of the autoclave clamped shut. An autoclave is essentially a hollow metal shell designed to withstand an internal working pressure of approximately 100 lbs. p.s.i., with a swinging door that can be bolted tight. As the transfer car is moved into the autoclave, the original vacuum connection is shut off and reconnected to another vacuum line, H, which passes through the outer shell of the autoclave.

After the autoclave is tightly closed, the fluid medium, usually steam, enters the autoclave through the pipe, J, until the internal pressure reaches between 50 and 100 lbs. p.s.i., as may be required. At this point the vacuum may be shut off and the interior of the bag vented to atmosphere. The elapsed time for building up the temperature and pressure in the autoclave is a matter of several hours. When the adhesive is cured the pressure is released, the autoclave opened and allowed to cool off, after which the transfer car is withdrawn.

The cost of this entire cycle of making plywood in compound curvature, by this bag molding process, is such that its use is limited to boat hulls, monocoque aircraft parts, and a few other specialties.

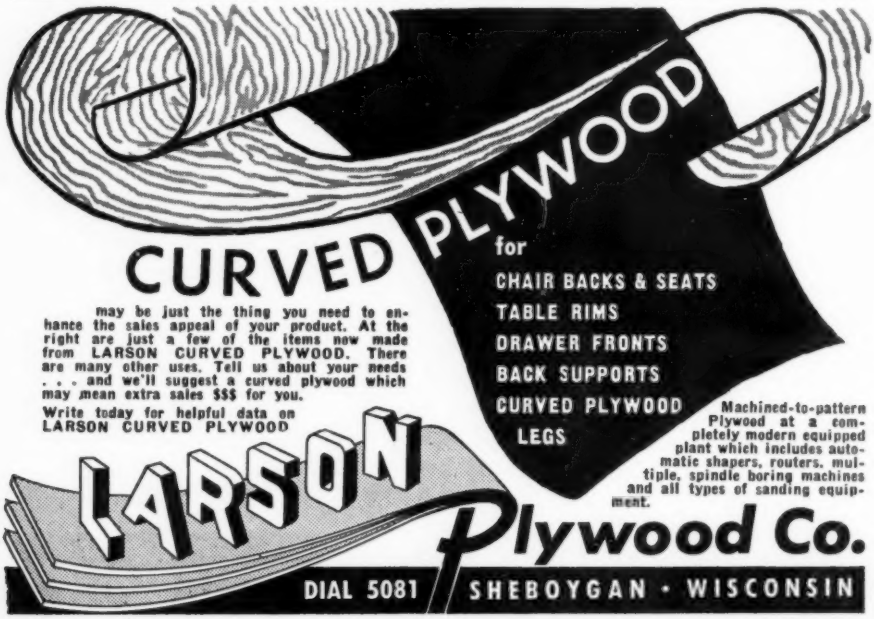
When plywood areas are small or moderate in size, a much simpler bag



molding process has been devised, which entirely eliminates the autoclave. Instead, a concave die, L, Fig. 5, is used, made of metal and provided with a cap, H, Fig. 5, that can be bolted tight. Such a piece of equipment, designed to make a simple half sphere, is illustrated in Fig. 5. This method employs an internal flexible bag, E, which is inflated, whereas in the autoclave process it was deflated. The veneer layers, G, rest against the metal die and will be smooth, requiring a minimum of sanding. Reinforcing layers can be added, as at H, to provide extra thickness for scarfing, if the two half spheres are to be joined into a complete sphere. No vacuum equipment is required. The veneers are assembled on a reverse (convex) dummy, thus reserving the metal dies exclusively for the pressure-bonding cycles. In addition these cycles are much shorter than in the autoclave process, and will usually average less than an hour each. Drainage ducts are provided, through the bottom of this metal die, for the escape of air and condensation, as shown at F, in Fig. 5. The inlet for the pressure medium, usually steam, is at J. An outside exhaust valve should also be provided to facilitate emptying the bag.

A further simplification of this process substitutes a relatively thin air cushion, instead of the larger bag, as is shown in Fig. 6. This substantially reduces the amount of steam required and correspondingly shortens the elapsed time of inflation and exhaust. While the sketches in Fig. 5 and 6 both illustrate a half sphere, any other shape can be made in the same way.

There are many other variations in equipment designed to produce compound curvature in plywood, but the fundamental principles are the same. Mechanical hoists and autoclave clamps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are usually employed to handle the caps, which do not have an opportunity to cool off during continuous cycles.

Conclusions

Compound curved plywood has extraordinary strength/weight ratios, far more than any competing materials, such as metals or plastics. The dielectric characteristics of plywood are of definite significance in radar and other electronic communications equipment. Most of such equipment and their plywood parts are "hush-hush" and can be little publicized.

Such monocoque plywood, as it is usually termed in the aircraft industry, obviously, is in the higher cost ranges, but its unusual qualities frequently make its use mandatory.

This process of molding plywood into compound curves might well be considered the pinnacle of achievement in the plywood industry, and its development has been largely within the last twenty years. That these processes will be still further improved, in the years to come, seems reasonably certain.

Perhaps the simplest method of adequately demonstrating the advantages of compound curvature in plywood, is to call attention to the molded boat hull, which is rapidly gaining in popularity. Is there any reader of this article, who would prefer a small boat, up to 18 feet long, made with many joints, requiring continuous calking, and having the extra weight of solid lumber, even at a lower first cost? This in contrast with a molded plywood shell, without any joints, and without the maintenance problems that such joints inevitably develop, even at a considerably higher first cost?

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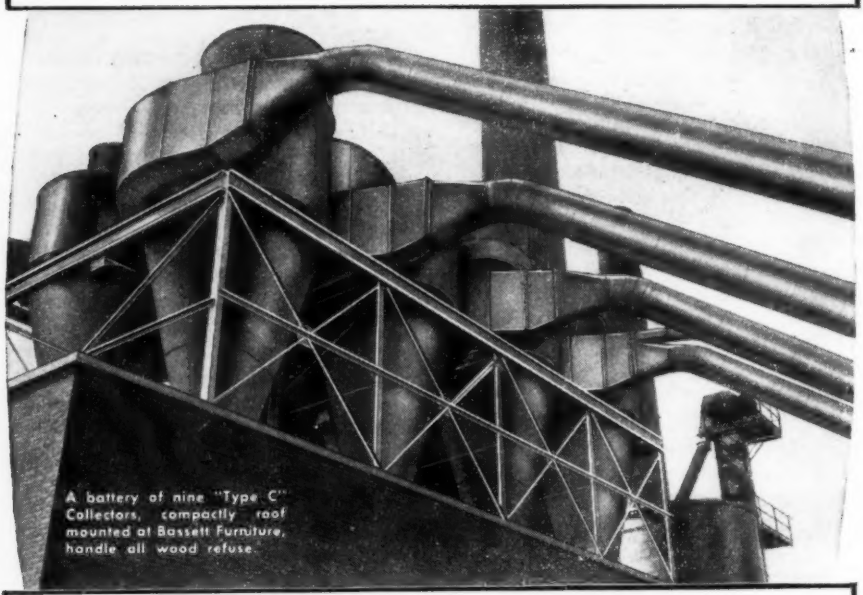

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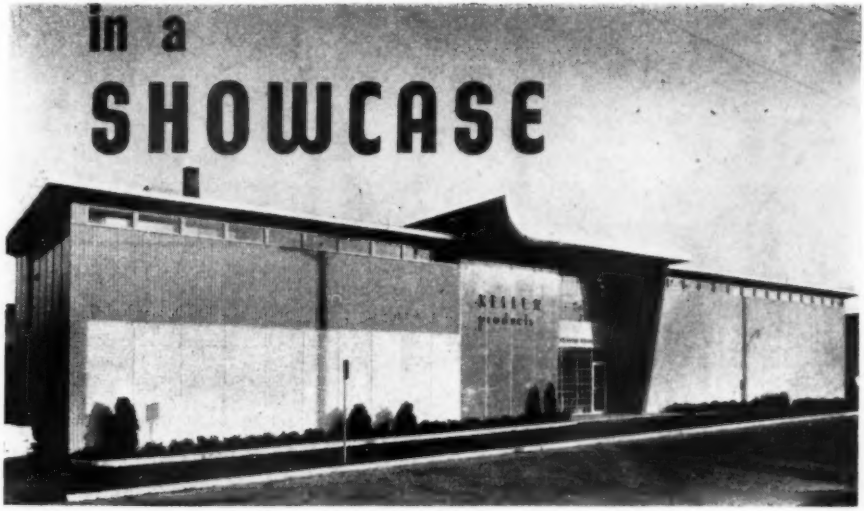


By Paul H. Graham

KELLER Products, Inc., is probably the only concern in the country that conducts its business affairs inside a showcase of its own products. The building that houses its administrative, accounting and engineering departments displays many unusual and inventive ways of using plywood and Fiberglas panels and incorporates products of Keller's own manufacture, including the office furniture.

All walls and partitions are factory fabricated Kalwall sandwich structural panels, the latest Keller product development. These are recognized as being among the most modern building materials on the market. Production and use of these panels in this building has created considerable interest in the building trade as the use of prefabricated structural panels of such large dimension is relatively new in any material. Their use permits building walls, partitions and roof using only a few prefabricated structural panels without any skeletal framework. Color, texture and finish of the panels are also prefabricated for the builder.

Keller Products, Inc. was founded in 1944 at Manchester, N.H., by its president and treasurer, Robert R. Keller, and evolved originally from a research organization, Keller Products Laboratories, and a product development and management organization, Robert R. Keller and Associates. The latter organization is still active and the two organizations combine to offer complete engineering, design and manufacturing facilities.

Keller designed, engineered and fabricated many World War II products of molded plywood, reinforced plastics and sandwich construction and is still actively engaged in the development

President Keller's office uses the company's products to best advantage for lighting, floor, wall and ceiling and also office furniture.

and fabrication of products for the military as well as for private industry.

The principal products of this company include molded plywood, flat plywood, metal-faced plywood, plywood tubings, laminated wood, reinforced plastics and sandwich panel constructions. The list would be considerably longer if special products resulting from development contracts were included.

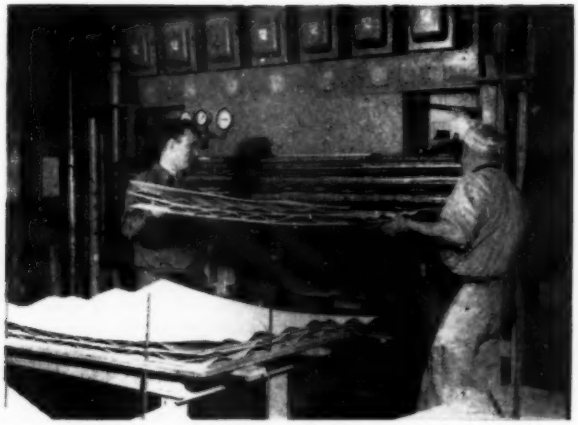
The more recent sandwich panel products represent the company's best of its experiences and know-how in developing specialty products both for government and commercial use. Keller has integrated these accomplishments into a series of standard products for both building and interior use. By utilizing the most modern techniques in laminating with highly engineered joint systems, the company has integrated in its prefabrication products of high architectural beauty, pre-finished surfaces of high durability and ease of installation.

Keller products are produced in a modern plant which has about 52,500 square feet of manufacturing floor space. The plant is strategically located on the main rail and highway routes and occupies a central location in the New England area for good customer service. Under normal conditions about 120 persons are employed and operating conditions are highly favorable to a greatly expanded program, such as is now in progress.

A tremendous volume of materials is required, wood, metal and plastics, and modern materials handling equipment is provided to facilitate their movement, such as lift trucks, hoists and monorail conveyor. Various storage racks and similar devices have been developed to permit handling capacity of this equipment to be utilized to good advantage.

Flitches of veneer, for example, are stored in tiers on special bin-type platform skids so constructed that they can be handled individually for stacking or be removed from piles for delivery to the veneer cutting department by fork lift truck.

While conventional commercial veneer cutting, jointing and splicing equipment is used for veneer preparation, many ingenious machines have been developed by Keller to meet fabricating requirements of laminated



Operators load flat press made by Keller to provide a greater range of pressure and temperature required in its type of operation.

products of flat and molded plywood, laminations combining metal, wood, plastic and cloth, and reinforced plastics.

All dies are fabricated here to meet individual job specifications and a wide variety of standard dies are used for regular production items. These are ingenious hot plate dies, electrically heated and equipped with thermostatic control. All presses used were also developed and constructed in the plant. These presses are designed to use both pneumatic and hydraulic pressure in a general range of 40 to 120 lbs. p.s.i. The bonding temperature range runs from 250 to 350 degrees F. Individual jobs may call for higher or lower pressure or temperature range.

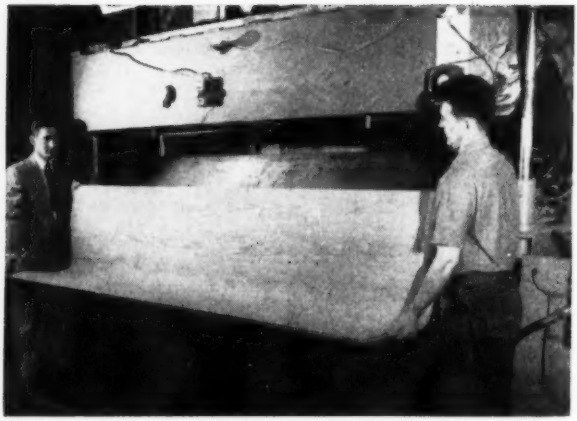
Accurate control of humidity and moisture is maintained not only in veneer storage and at the presses, but also throughcut the plant by means of an automatic humidifying system.

A quality product is assured by careful selection of components and laying up all constructions so that proper balance is maintained beycnd the center line. Fabrication methods are all adapted to requirements of the end product. Made-to-order facilities are engineered when standard equipment will not do the desired job.

Conventional equipment is used for metal-wood preparation and metal laminating, but Keller also develops its own ingenious facilities to improve quality, combine operations and increase production. Metal-to-wood bonding of metal extrusions is performed by machinery especially designed by Keller to make this a completely automatic operation.

The new Kalwall structural sandwich

Palletized rotary-cut veneer is handled in and out of storage by fork lift truck.



Keller-built church pew molding press, with typical 10' blank being removed for further operations. Shown above the die is thermostat, direct reading thermometer and timing device, all essential to proper quality control.

panels are probably the most interesting product currently fabricated in the Keller Products plant and incorporate many unusual features and materials.

The translucent factory fabricated Fiberglas panel, such as was used for exterior walls, interior partitions and skylights in the "showcase" office building, is a sandwich panel faced two sides with polyester resin reinforced with Fiberglas fabric skins laminated rigidly over an inner core of light extruded aluminum "I" beams. The translucent panels serve to transmit light to the building interior of various hues, changing constantly with the hour of the day and season of the year to produce interesting effects. At night, the same attractive color tones are transmitted to the exterior of the building. In addition to the variety of color hues, the pattern produced by the aluminum grid core, with light on the opposite side, is very interesting.

Keller-built cove molding press. Operator holds standard cove used for interior trim.

Wall panels are usually made 2¾" thick and partition panels 1-9/16" thick. The 2¾" thick panel weighs only 1¾ lbs. per square foot. It is regularly produced in panel size of 4' x 20', with other sizes cut from this panel as required.

Wind load tests showed these panels capable of withstanding wind velocity of 100 m.p.h. with a panel 10' high. Using a panel 8' high as a column, failure (separation of Fiberglas from core) required a load in excess of one ton per lineal foot of width. Using a panel as a skylight, the panel carried a load of 50 lbs. per square foot. The panel showed good resistance to humidity and moisture, without condensation or fogging, and showed good heat resistance at temperatures up to 800° F.

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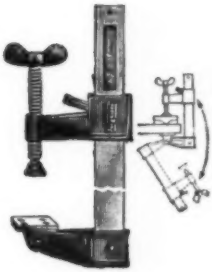

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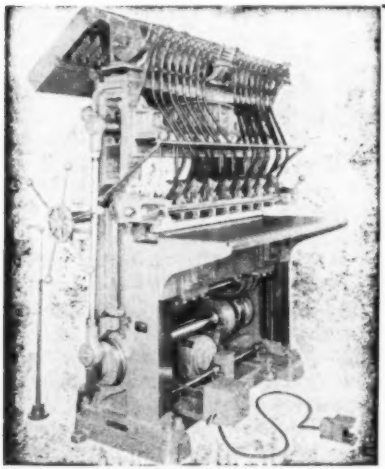

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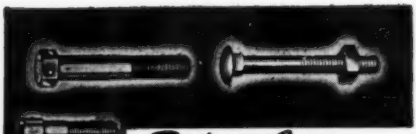

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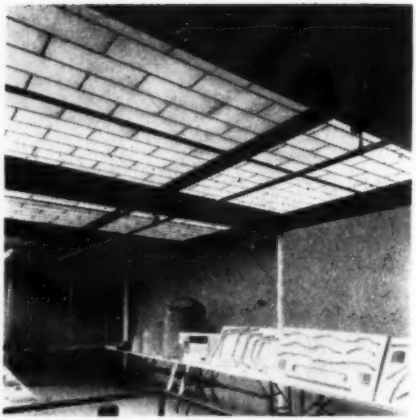

Fiberglas Kalwall panels form skylight. Various molded plywood products and Fiberglas radomes may be seen at the right.

installation of these panels, threaded for their entire length on the exterior and drilled on 12" centers on interiors. Panels can be slipped into place and joined with this special extruded molding, fitted with neoprene rubber gaskets to seal the joint. The moldings provide a floating joint to allow for normal expansion and contraction.

A complete system of honeycomb partition panel 4' x 8' and 1-9/16" thick is also available. These panels consist essentially of an inner core of Kraft honeycomb paper for the purpose of stability and rigidity. For the less expensive type of installation an economy grade is available with facings of waterproof composition board that is used as received and is capable of taking a fine paint finish also.

Where requirements call for a more durable and decorative surface, plastic sheets are available as facings in a variety of wood grain or linen pattern, thereby giving the additional qualities of a greater decorative effect without maintenance. Keller also recognizes requirements where nothing can truly take the place of natural wood surfaces. For such needs most of the fine grain

Kalwave ceiling panels of molded plywood provide interesting and attractive ceiling treatment.

wood veneers in high quality nicely matched construction are provided.

All panels are faced with ⅛" laminates and are good two sides. A suggested method of installation not only includes electrical raceways, doors, windows, etc., but also makes each of these panels a movable partition.

The trade has become enthusiastic over the modern, economical and efficient method of building construction provided by Kalwood floor and roof panels. Each panel is an integrated building unit, fully insulated, self-supporting (requiring no intermediate support) and is ready for installation as received.

The panel consists of 4" of phenolic impregnated Kraft honeycomb core, faced two sides with ¼" AC waterproof fir plywood panels, which are in turn bonded to the core with waterproof glue. The panel is also edge banded with solid lumber so that the core is not exposed. The banding is dadoed two sides to receive a spline.

The overall panel is 4' x 8' x 4½", weighing approximately 2½ lbs. per square foot. As received the panel may

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be bolted to supporting members on 8' centers, carrying a live load well in excess of 50 lbs. per square foot. The spline is suggested to seek a uniform level in panel to panel attachment.

Kalwood roof panels are used in the "showcase" office building of Keller Products, Inc. with a 5-ply tar and gravel top. The roofer gave a 20 year bond after engineers studied and passed on the Kalwood panel understructure. Advantages of Kalwood roof and floor panels include fabrication under accurately controlled factory conditions; reduction of installation cost to a fraction of normal field fabrication; no waste; and provision by a single panel of a smooth top, an insulated core, and an "A" face ceiling panel below, all contained within a single building unit.

Ceilings and wall interiors of the Keller offices make use of Kalwave, a new molded plywood product with an attractive wave design, and match molding to make panel joints part of the over-all pattern. Ceiling "I" beams are boxed with waterproof plywood and Kalwood cove moldings in two radii carry one surface smoothly into the other.

A wide variety of molded plywood items are manufactured by Keller Products, designed to provide round corner utility for millwork, fixture and furniture designs for such application as TV and radio cabinet curved panels, lids and corners, chair seats, backs, legs and arms, table rims, case sweep fronts, waterfall tops, plywood "I" and box beams, cove moldings, church pews, vehicle structural parts, marine structural parts, sporting goods and aircraft and airborne equipment.

Flat plywood is produced for utility and decorative applications. Metal faced plywood is manufactured for use as lightweight panels and moldings, reflectors, X-ray and atomic shielding, truck body paneling and aircraft parts. Plywood tubings are supplied for antennas, floats, rocket tubes, radar masts, poles and equipment cases.

Through an articulate process developed by Keller, various matching wood veneers and plastic overlays are laminated to a variety of extruded aluminum shapes, for installing either wood or plastic panels. These matched moldings develop a much desired "shadow effect" and eliminate gaps, bulky moldings or flashy metal trim.

Although Keller Products does not intend to slight any of these products, it believes that by moving into the production of lightweight structural sandwich panels it is helping to build a better future. Techniques have been developed whereby these sandwich panels can be manufactured of almost any combination of materials, engineered to meet an exact application.

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SYRACUSE, N. Y. 157 Richmond Avenue (1) Phone: 2-8242

Considerable publicity has recently been given to sandwich panels fabricated by Keller to meet the exacting requirements of the TV transmitter building on the summit of Mt. Washington constructed for Mt. Washington TV, Inc., where weather conditions are most severe and winds have recorded velocities of 231 miles per hour.

The team which combines their forces to make these notable accomplishments possible include: Robert R. Keller, president and treasurer; John C. Stanhope, vice-president and production manager; Robert Solow and Charles Wustlich, sales managers.

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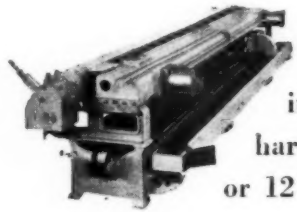

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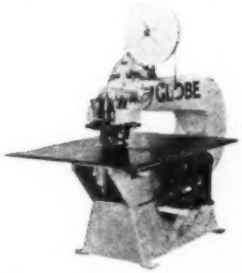

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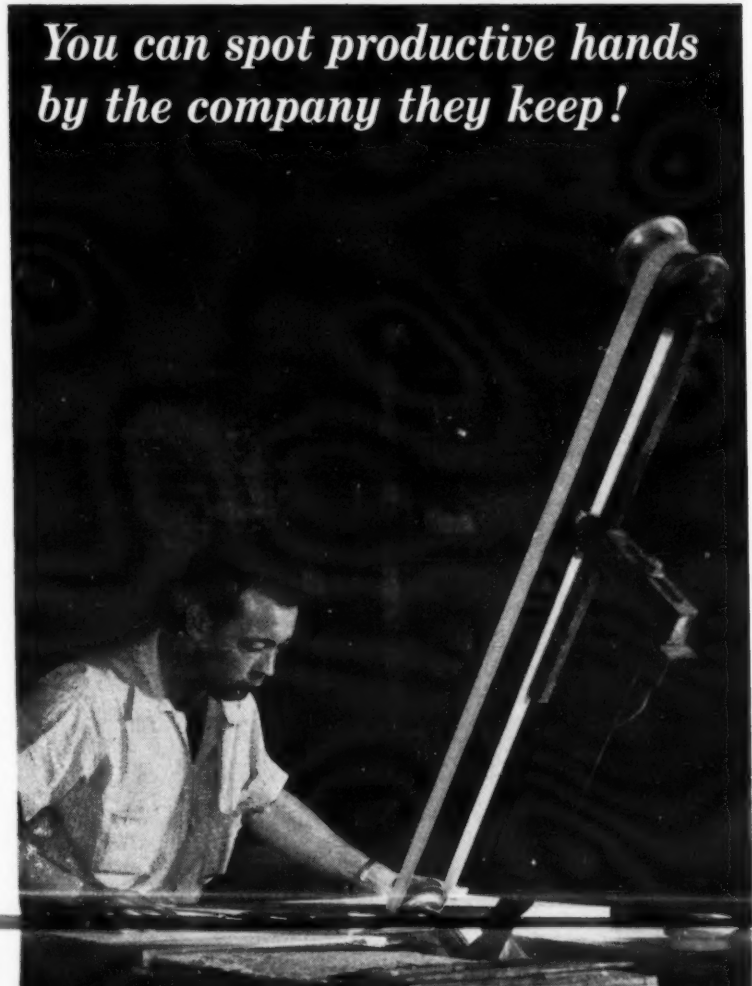

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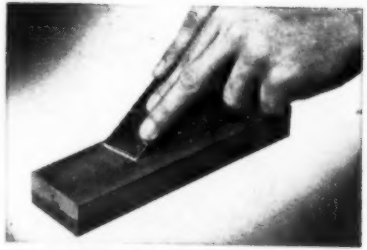

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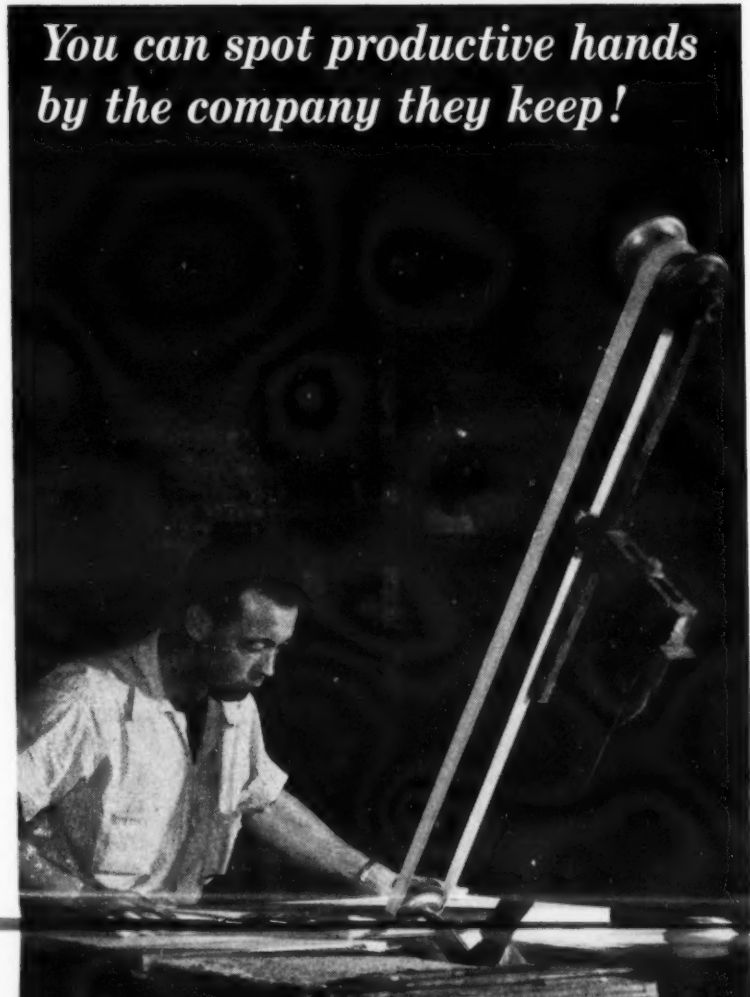

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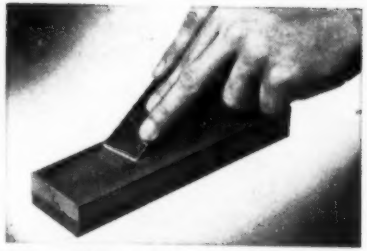

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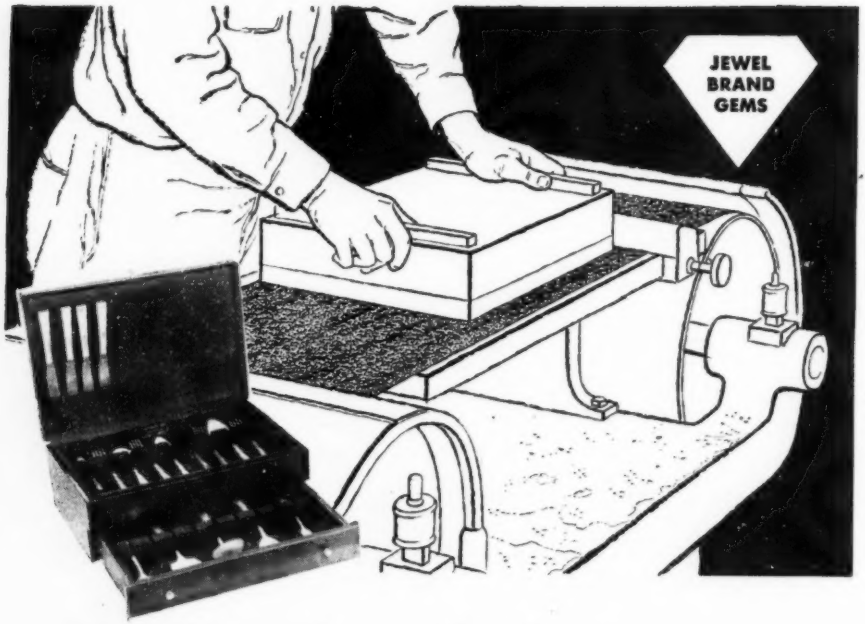

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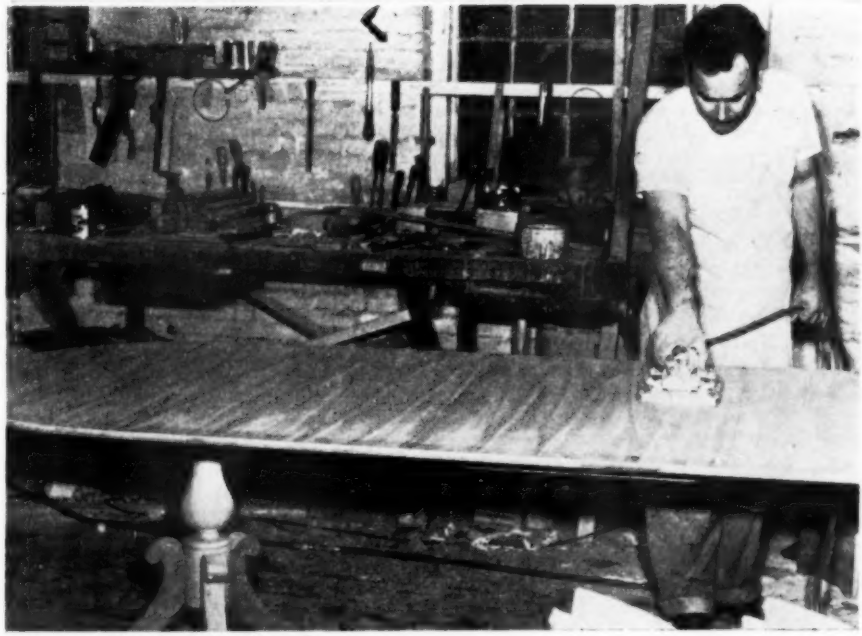


Courtesy The Carborundum Co.

A Picture Story at Tayco

By Walter Rudolph

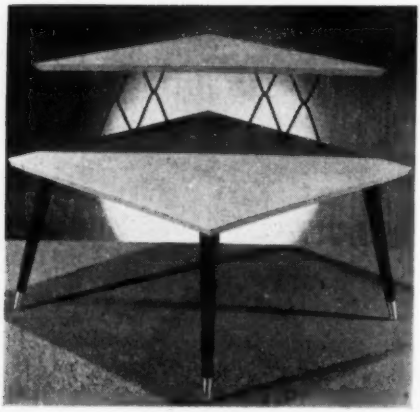
Furniture Finishing . . . . . Part V

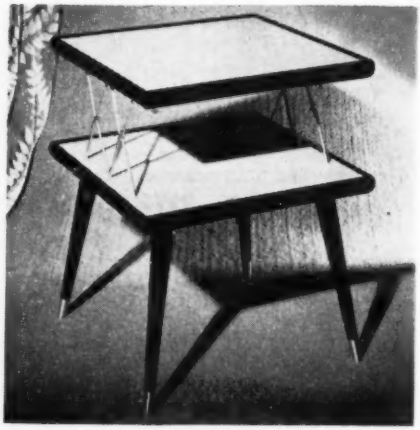
By Harold B. Gatslick

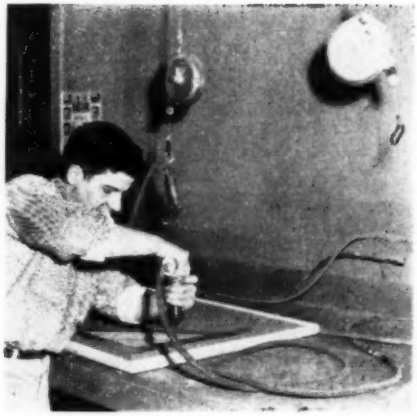
TAYCO TABLES
and Finishing Techniques

By Walter Rudolph

In production now for nearly a year, Tayco Products, Inc., Jamestown, N.Y., is mass producing a "Carefree Modern" line of tables—cocktail, end, coffee and so forth,—that has met with popular success in the furniture market. Hundreds of units are shipped weekly from the large plant that features the latest in wood processing and finishing equipment, with particular attention to materials handling in the finishing department. Herewith is a photo-review of some of the highlights of Tayco production and painting of "Carefree Modern" tables.







• • •

Several work tables have air-powered tools—drills, screw runners, etc.—suspended on cable from counter-balancing reels to relieve worker fatigue; here fixture aids spotting of holes to be drilled.

• • •

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Again counter-balancing handles stapling gun used in upholstering of chair seat, a sideline. "Homemade" press uses air cylinder and foot release to hold piece being covered.

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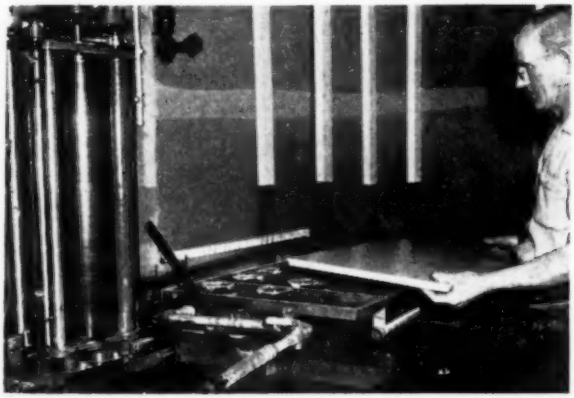

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Graining machine in finishing department is enclosed in cheesecloth "booth" to keep down dust; table top has already received sealer-filler and prime coat, as well as hand rubbing, before this operation.

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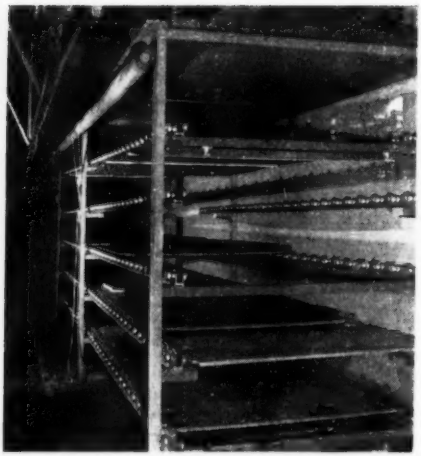

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Roller-conveyor shelves carry table tops between finishing booths, aid flash drying; pallets hold pieces on four lower levels, slightly inclined away from camera. Top shelf inclines toward photographer for pallet return to initial spray booth. Duck cover, left top, is lowered when dust is raised in cleaning, to protect wet paint.

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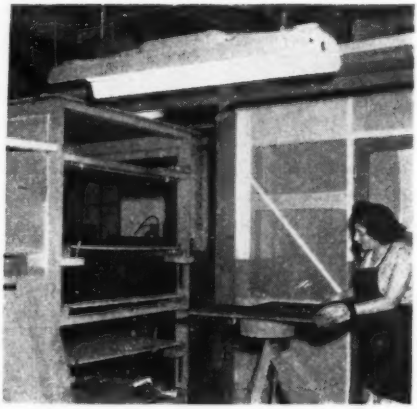

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At "break" in roller conveyor shelving, worker does hand sanding of partially finished table tops, then places them on another section of conveyor for next operation. At worker's right is cheesecloth "wall" of the graining enclosure.

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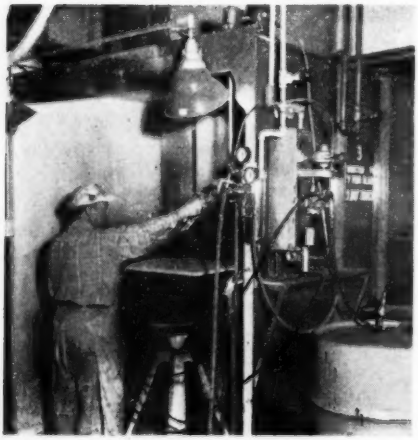

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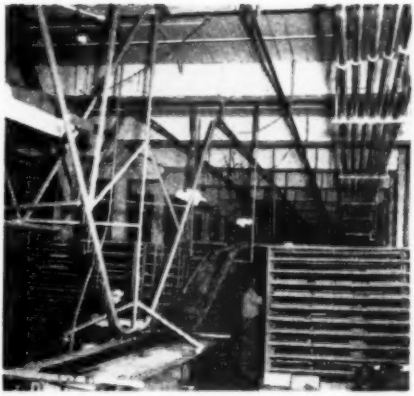
This is last of the three spray booths at Tayco, where water-clear lacquer is sprayed on table top that has had multi-stage finishing operations along roller-conveyor line; this is hot spraying, followed by flash drying on carts pushed into another part of the room.

• • •

The primed, rubbed, grained, lacquered table tops finally reach the final polishing table, where both power and hand rubbing is done to produce a highly glossed finish of simulated lime oak or birch. Handling is at a minimum, as the piece goes from the mobile cart, through this polishing-buffing operation, on down table to packaging for K-D (knock-down) merchandising.



Another feature of this finishing department is an overhead monorail chain conveyor, about 1200' in length, used principally for finishing and air-drying table legs, both wood and metal, in priming and final dip-coating operations; dip tank is in foreground and many feet of encircling conveyor shown overhead. Carts for handling table tops are also shown, obscuring the final rubbing and packaging tables.

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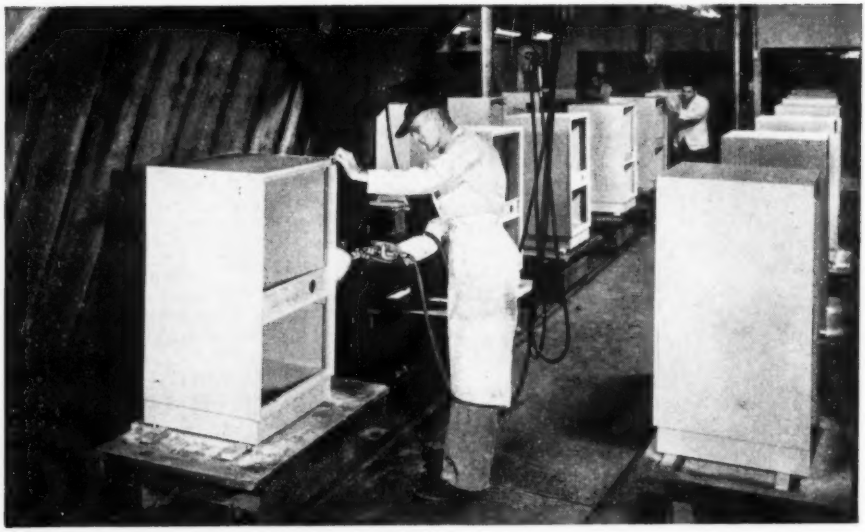

DeVilbiss spray gun gives operator a wide pattern at normal pressures. Fewer passes mean less painter fatigue.

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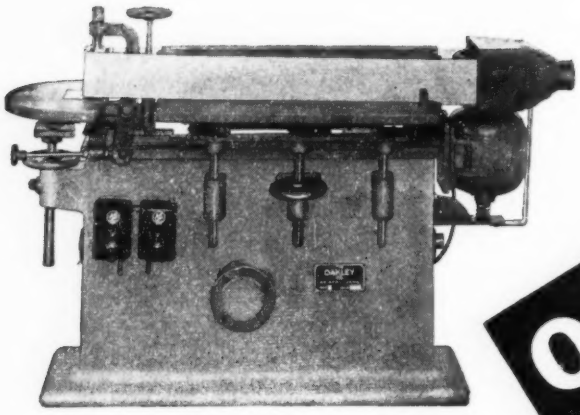

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H-6 EDGE SANDER

A light-duty yet sturdily built edge sander designed for plants where floor space is at a premium and where heavy equipment expenditures are not advisable. Also in those departments where the size of stock does not require larger machines. Made in 2 models. H6 is the oscillating type and the H-6A which is non-oscillating. The latter is recommended where the oscillation of the sand belt is not required.

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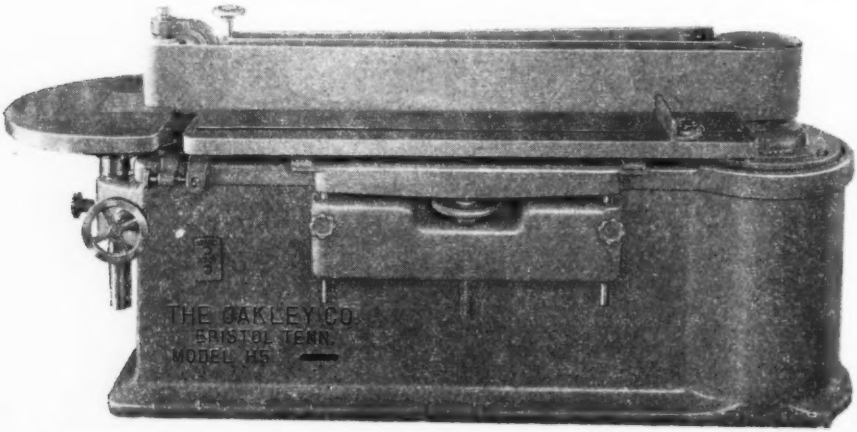
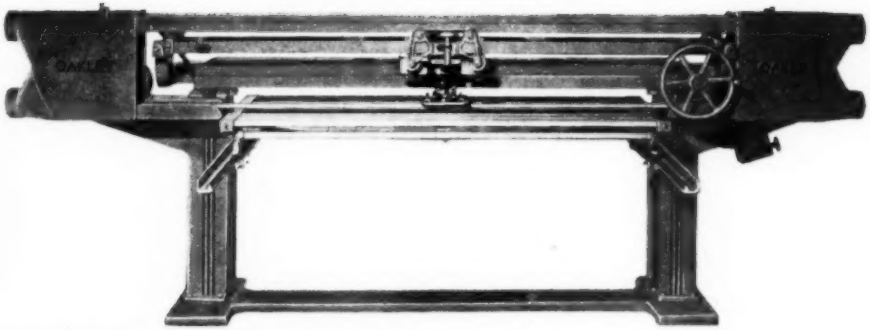
Pictured are a few of the many Oakley Sanders which have been designed and engineered from the standpoint of practical sanding practices. Here at Bristol on the Tennessee-Virginia border is an organization with experience and "know-how" . . . gained through years of work with plants sanding small toys to those who must sand large panels. Not only skilled in the art of sanding,





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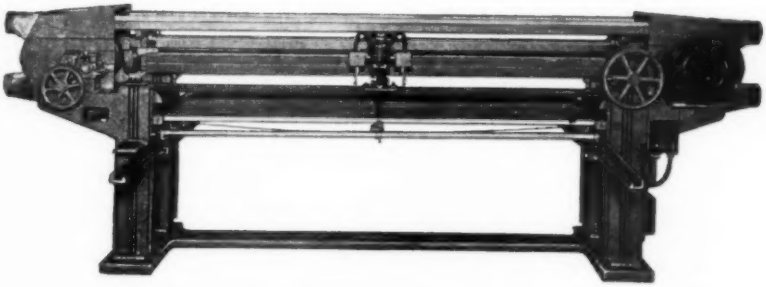
This Oakley can best be described as a high production, streamlined sander which is high in speed, semi-automatic, reversible, dust proof. Sanding capacity 6' 8", 8' 8" or 10' 8".

D-1 REVERSIBLE DOUBLE SANDER AND POLISHER

With a single handling, the Oakley D I double belt sander removes the tape, polishes, eliminates raised grain . . . without sponging or glue sizing . . . and the stock is ready for the finishing room. Sanding capacity 6' 8", 8' 8" or 10' 8".



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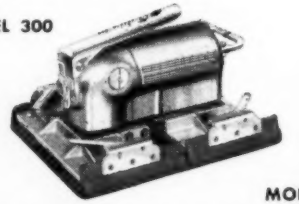
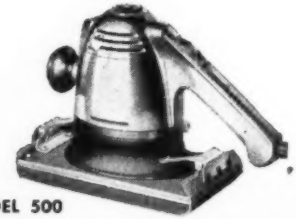




MODEL 500

NATIONAL AIR SANDER, INC., ROCKFORD, ILLINOIS

FURNITURE FINISHING

By

HAROLD B. GATSLICK

INADEQUATE surface preparation is not always immediately apparent. Unfortunately, poor control in surface preparation often is not discovered until after several costly finishing operations have taken place. Mottled color, muddy or rough appearance, excessive orange peel, filler popping, pinholing and subsequent checking may be related to faulty surface preparation. The statement is basically true, granting, however, that many of these defects or problems may also be caused by the finishing materials and/or methods of application. Nevertheless more often than not, these problems can be related directly or indirectly to the condition of the piece when it arrived in the finishing room.

This article will deal primarily with two major problems asscciated with surface preparation—raised grain and humidity control.

What Is Raised Grain?

A simple definition of raised grain would be that a smooth wood surface becomes rough on exposure to the atmosphere or on being wetted. Raised grain may be classified into several types. The basic wood structure and the grain angle are important factors that have a major effect on the degree and type of raised grain.

A discussion of the results and conclusions of Dr. George Marra's work on raised grain in oak performed at the State University of New York College of Forestry are of interest. Although this study was restricted to one species, much of the information is generally applicable and should help to explain the occurrence of raised grain more definitively. Dr. Marra classified raised grain in oak into three types. The first type is that associated with vessels or pores, whereby a segment of these larger wood elements is not completely severed in machining or sanding and falls into the pore opening or valley. Upon the absorption of moisture, this piece swells and attempts to assume its original shape or position. This process repeated many times produces raised grain.

The second type of raised grain is associated with scratches occurring in machining or sanding. The same incomplete cutting or roughing occurs, not only in the pores, but also in other wood elements. On subsequent moisture absorption, the raised grain effect may cover the complete surface or follow a specific pattern.

The third type of grain raising is associated with fiber-fiber separation. The wood material of the cell wall of some elements may be denser or so arranged that some fibers will swell

to a greater extent than others upon moisture absorption following machining or sanding. This, of course, would be true where there is a marked difference in the wood structure as is evidenced in springwood and summerwood or heartwood and sapwood in numerous species. However, density variation of individual elements does not always follow a specific pattern.

In his studies on raised grain in oak, Dr. Marra reached other conclusions:

1. Angled grain can be associated definitely with the severest cases of raised grain.

2. Sanding against the grain produces all three types.

3. Raised grain appears to be directly related to the heat generated during sanding.

4. Cross-grain sanding with fine abrasive grits tends to reduce subsequent grain raising.

5. Coarse abrasive grits produce more raised grain than fine abrasive grits.

It can be seen from these statements that the species and the methods of machining and sanding must be considered to minimize grain raising problems in production. A minimum time lag between final sanding and finish application of materials using nonaqueous or hygroscopic solvents will also tend to reduce grain raising.

If water stains are used or high humidity conditions are prevalent in the plant, glue sizing may prove to be the answer for minimizing grain raising effects.

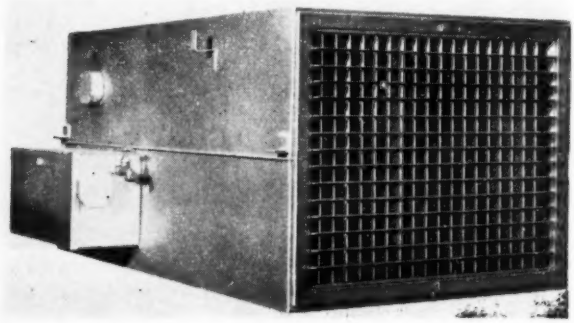
Glue Sizing Is Important

Glue sizing has two primary advantages. It stiffens surface fiber walls so that they can be cleanly cut off by a light sanding and thereby not protrude into or through the finish. Secondly, glue sizing will tend to make the surface more homogeneous in its absorption qualities thereby allowing for a more uniform staining. Glue sizing is applied with a soft cloth or sponge, by spray, brushing, and occasionally by use of a coating device such as a glue spreader. Glue size consists of animal hide glue with 8 to 20 parts of water.

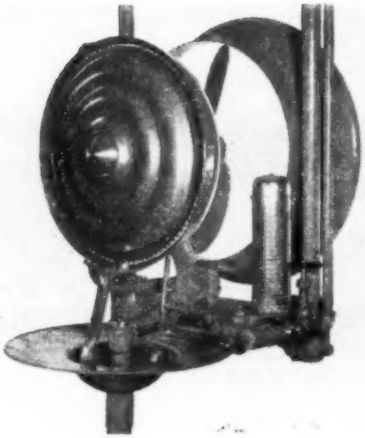
Glue sizing also is recommended when filler is to be applied to bare wood to prevent filler oils from bleeding into the wood and to provide for a simpler padding operation. In sizing it is desirable to apply only a sufficient quantity of size to affect grain raising, holding the fibers in place and drying in a minimum time. If excessive water is used, a long drying time will be required and if the hide glue is used in excess, difficulty will be encountered in sanding the glue-sized surface. A warm glue size is recommended for better penetration and faster drying.

Other Problems

Before discussing humidity control



Bahnson Type BA humidifier. It is available with heater section, various fan arrangements and air intakes.



Centrifugal Bahnson, humidifier, Type L with Type J indivdual automatic control.

and its place in the modern production finishing room, it might be well to mention a number of other poor practices prior to actual finishing operations that result in defective finished goods. Those which are quite common are:

1. Excessive drying of face veneers when using re-driers.

2. Excessive surface drying resulting in the development of minute checks caused by too-hot platens in panel gluing extended press time.

3. Excessive pressure in gluing.

4. Use of glue which is too thin with subsequent bleeding.

5. The excessive use of wax or other adhesive repellants on cauls.

6. Grease and table wax on machines.

7. Use of dull abrasives which cause tearing rather than cutting.

8. Polish sanding where heat and pressure produce a pseudo-smooth surface.

9. Cross-grain sanding not followed by with-the-grain sanding.

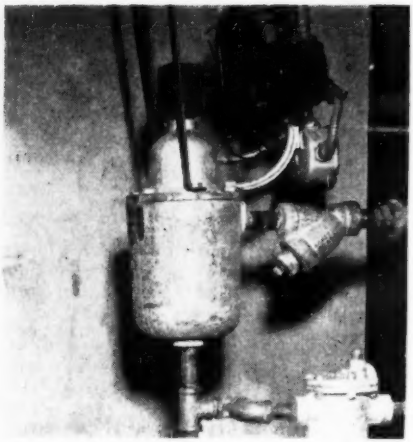
10. Excessive water sponging and glue sizing.

11. Panels prepared with the loose side of the face veneer exposed have a greater tendency to develop checks than panels prepared with the tight face up.

One problem for which no simple remedy has been discovered is the elimination or hiding of heavy thermo-setting glue spots. One of the most recent techniques for detection of glue spots has been the incorporation of a fluorescent dye called "Neon-X" into the glue mix. When a glued product containing the Neon-X is passed under an infrared or black light, any excessive glue becomes illuminated and stands out.

Surfacing edge glued panels before glue line moisture has equalized throughout the panel is a common error which is greatly magnified in the finished piece. It must be remembered that all commercial glues incorporate a large amount of water. This moisture, in turn, causes significant swelling of the wood immediately adjacent to the glue line. Machining while these wood fibers are in an expanded condition results in removing an excessive amount of wood, and, upon equalization, a

Here is a self-contained Bahnson humidifier.



Close-up of Armstrong humidifying unit.

gouged or valley effect is produced in the critical area. Therefore, edge glued panels should be allowed to dry from 6 to 24 hours for adequate equalization. The exact time will depend upon the plant conditions, the species, the glue formulation and the method of bonding.

Humidity Control

Humidity control is, in effect, the use of one of several techniques to hold the moisture content of the wood surface at an optimum for processing. The first question might be "Why is it necessary to humidify today when furniture plants were producing quality furniture 20, 30 or 50 years ago before humidification was ever heard of?" The answer to this question is simple. The cost of labor and materials, the types of materials and production methods and timing today are considerably different from those of a few years ago.

Where high humidities are encountered in the spring and summer with the plant windows open, stock will pick up too much moisture. Installation of a de-humidification system or air conditioning is generally not practical nor economically feasible. Drying stock to a slightly lower moisture content than that desired, solid piling and low stock inventory often prove to be sufficient control techniques. Another technique is the maintenance of a temperature of 15 to 25 degrees above the outside temperature in a separate in-process storage room. In many areas, this would produce moisture contents in a 7-9% range.

The biggest difficulties arise in steam heated plants in the winter where the humidity becomes very low and, consequently, the surface moisture content of the stock drops down to the 0-3% range.

Relative humidity is the amount of moisture in a given volume of air compared with the amount of moisture the air could hold if it were completely saturated, expressed as a percentage. That is to say, if a cubic foot of air at a given temperature could hold 100 grains of water vapor when completely saturated, and only held 50 grains, the relative humidity would be 50%. The surface of a piece of wood at 50% relative humidity would attempt to reach a moisture content of approximately 9%.

The big problem is that as the temperature decreases, the amount of moisture a given volume of air can hold is materially reduced. If the outside temperature in the winter were 0°F. and the relative humidity 75% that same air heated to 72°F. would have a re-

• • • •

In this series of articles it is not always possible to include as many illustrations and descriptions of equipment as we should like to cover.
We are particularly sorry that space in our May issue did not permit a complete description of the Oakley sanding machines. The Oakley Company, Bristol, Tenn., has an excellent line of sanders. Write directly to the firm for descriptive brochures.

MORE FINISHED PIECES *per belt*
with this new BELT CLOTH

For edge sanding—on irregular surfaces, contours and flats—CARBORUNDUM's new BELT CLOTH gives you the heavier weight backings and extra tensile strength that means greater resistance to wear. Cloth is specially prepared before coating to impart strength, toughness and adhesion of the grit. You get the same high initial rate of cut over a greatly *extended belt life.* Specific coatings for hard or soft woods—for use on belt machines and pneumatic drum sanders.

YOUR CARBORUNDUM DISTRIBUTOR will be glad to arrange a demonstration of this cost-cutting Belt Cloth in your own shop. Call him today—listed in the yellow pages of your phone book under "Abrasives." Or write The Carborundum Company, Dept. WD 82-512, Niagara Falls, New York.

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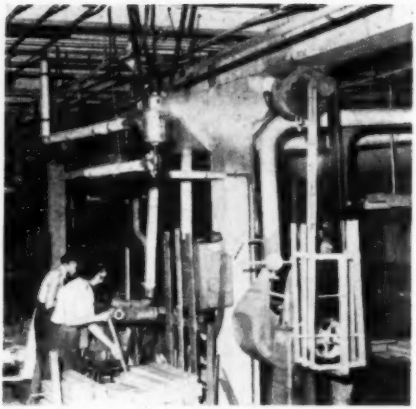
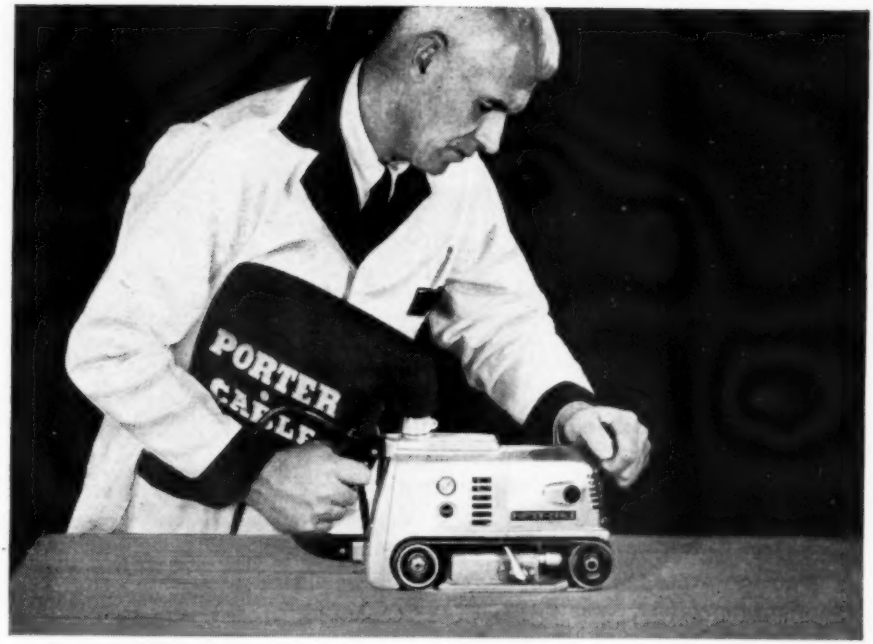


Girls sanding stock. Note Armstrong humidifier.

lative humidity of 3.6%, which would induce drying of any exposed wood surfaces to approximately 1% moisture content. Because of the large amount of air exhausted through the spray booths and dust collecting systems of furniture plants, many companies at first felt that it was not feasible to humidify the entire plant. This has been true in some instances, but humidification in the more critical areas of the plant such as the finishing room has proved to be a worthwhile and money-making investment.

Humidification can be accomplished in three primary ways. One is the atomization of water through centrifugal force or by means of spray nozzles with electric motors supplying the power. A second method is the use of atomized water with pneumatic pressure as the dispersant. The third method is to discharge steam. All three techniques can do an efficient, satisfactory job. The individual plant conditions would dictate the best method of humidification following a thorough investigation of the equipment on the market.

Control of humidity can, in effect, reduce or eliminate many finishing



Up to 25% more production with this dustless belt sander!

Here's the lightweight, easy-to-handle dustless belt sander that's replacing old-fashioned machines and methods in wood working shops everywhere—Porter-Cable's famous Model 503.

Like every Porter-Cable tool, it's built for *performance*. It takes the toughest jobs in stride—chamfering, rounding edges, removing surplus stock—in wood, metal, plastics, and other materials. Yet, its straight-line sanding action gives you perfect, silk-smooth finishing on any surface.

Powerful vacuum system removes 83% of the dust—gives maximum abrasive life, increases production up to 25%. Model 503 does the work of heavier, far more expensive machines—yet costs only **$142.** It's a *value leader* in the Porter-Cable line of *quality woodworking tools*—see it at your dealer's, or write for full information today.

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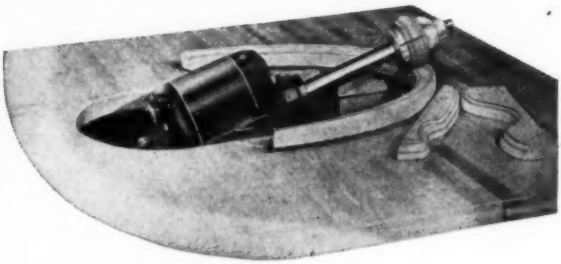

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. . . AND 60% to 80% saving on sandcloth has been reported by many plants using this efficient sander! Sands one or more stepdowns at same time; sands inside radii of circles and very flat tapered molding. With the Pearson Belt Attachment this model can be converted into an all-purpose sander at small cost. Write for full details today!

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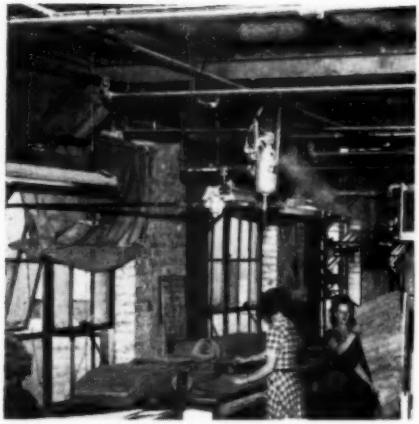
HIGH POINT, N. C.

problems. By maintaining the surface moisture content at an optimum level, more precise and uniform quality of surface smoothness can be attained in machining. Starved joints in gluing can be eliminated. The work life of abrasives can be increased as well as the quality of the cut which can mean decreased grain raising. Greater uniformity of color in staining and bleaching will normally result from humidity control. The checking of fancy faces and opening of the ends of edge glued material also may be minimized.

In addition to the direct effect on wood furniture of humidity control by humidification during the winter months, there are numerous other significant values. Dry air is uncomfortable and is sometimes the cause of dermatitis or accompanying conditions. Dry air is unhealthy since it makes the res-



Armstrong humidifier in use in a veneering operation.

piratory system more susceptible to airborne germs, many of which prefer low relative humidities. Low relative humidities also increase the fire and explosion hazard where volatile liquids or explosive dusts, such as those normally found in a furniture plant, may be easily ignited by static electricity.

A relative humidity of approximately 40% with a room temperature of 70°F. generally is recommended as ideal and produces a surface moisture content in wood of approximately 8% for most species.

The next article in this series will cover bleaching and introduce the general subject of undercoat and topcoat application.

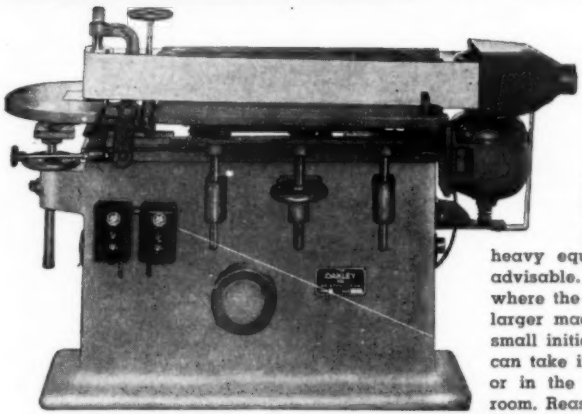
If you have questions regarding humidity control, send them along and we will do our best to answer them.

Bill: "I wish you boys wouldn't call me Big Bill."

Joe: "Why not?"

Bill: "Those college names stick—and I'm going to be a doctor."

The OAKLEY H-6 LIGHT DUTY SANDER



OSCILLATING AND NON-OSCILLATING MODELS

Here's a light-duty yet sturdily built Edge Sander designed for plants where floor space is at a premium and where heavy equipment expenditures are not advisable. Also in those departments where the size of stock does not require larger machines. With a comparatively small initial investment, the H-6 or H-6A can take its place in the production line or in the cabinet, pattern or assembly room. Reasonably priced. Write today.

Made in 2 models. H6 is the oscillating type and the H-6A which is non-oscillating. The latter machine is recommended for those plants where the oscillation of the sand belt is not required. Both models are reasonably priced. Send for full specifications and information.

THE OAKLEY COMPANY
BRISTOL • TENNESSEE

NEW SERRATED BELT EDGER

by Herbert Matson

Sales Engineer, Curtis Machine Company

This machine was briefly discussed in our May issue. We are giving a longer report here by reader request.

The woodworking industry is an old timer and machines and methods have undergone a long period of use and development. The abrasive belt, now finding its way into the metalworking field was pioneered in the furniture field. But, the metalworking industry, which borrowed an immense amount of abrasive belt know-how from the woodworking industry—is now returning a dividend to woodworking—the serrated contact belt and contact wheel on a new edge sanding machine that increases belt life production.

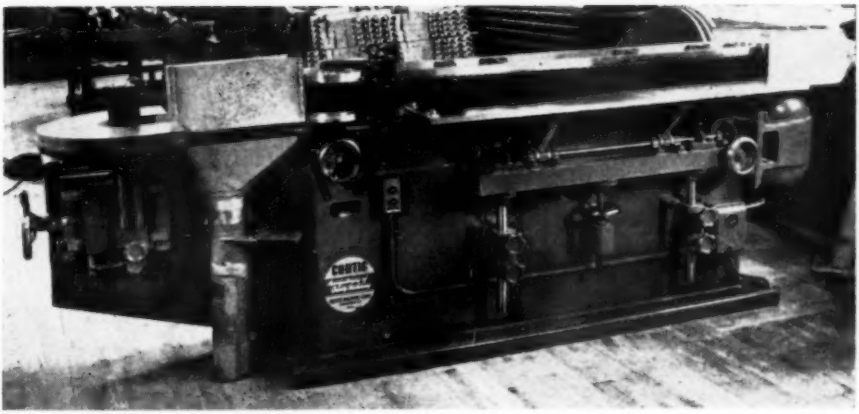
Introduced to the furniture industry at one of America's leading manufacturers of high quality, solid oak furniture, one belt on the new edger lasted as long as 8 belts used previously. Piece after piece can be worked on the new serrated contact belt edger with no fear of discoloration from heat burns. Three operators edge on the machine at one time, thus giving maximum returns per dollar of investment.

Designed and built by the Curtis Machine Corporation of Jamestown, N.Y., in collaboration with the Carborundum Company, the Curtis 91 serrated contact belt edger utilizes a 4" wide x 175" long Type 61 serrated contact belt and a Type 61 serrated contact wheel of 3" to 6" diameter. The abrasive belt size is 4" wide x 226" long. Other 6" and 8" wide belts are projected for this machine.

On this new edger, in addition to a platen, the abrasive belt is backed by the molded rubber serrated contact belt. The serrated belt runs between the sanding belt and the platen. The platen insures sanding of straight edges while the contact belt improves the cutting action of the abrasives and results in better finish, better belt life and increased production.

The platens and adjustable tables are positioned practically the same as on conventional edgers.

The edger has a substantial base and is equipped with a single motor which drives the serrated contact belt. The contact belt has an independent idler, tracking and tension control. The sanding belt is mounted over the contact belt but is considerably longer and passes over a separate idler with independent tracking and tension control. The contact belt acts as both a carrier and a backing for the sanding belt. The contact belt absorbs the driving pull of the motor, and absorbs the frictional heat together with the platen. This leaves the sanding belt



Curtis 91 showing view of the 4" x 175" serrated contact belt that powers and backs abrasive belt. Note the serrated contact roll on the left which serves as the idler pulley for the abrasive belt and backs the belt for sanding curved edges.

cool and free from excessive pulling action.

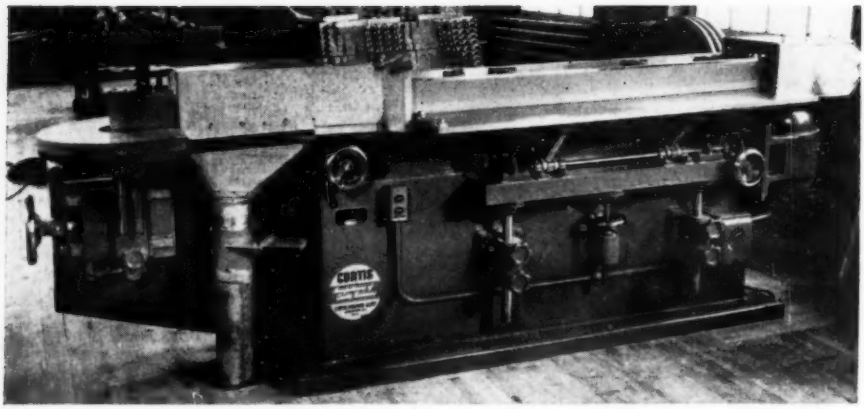
Serrated Contact Belt Action

Serrations, or grooves about a quarter of an inch deep at 45 degrees to the edge are molded into the contact belt. The abrasive belt flexes into these serrations so that only those portions backed by the lands are actually cutting or sanding. The flexed section allows "chip clearance" for cellulosic particles and ligneous dust which otherwise tends to fill up the belt. Just as boring bits and cutting tools require chip clearance for proper cutting, the sanding belt cuts better and faster if room is allowed for the wood particles to escape.

Three operations at one time. Left: edging a solid oak table top. Center: edging curved oak chair piece. Right: edging bevel on oak table piece.

A different portion of the belt cuts on each successive revolution. Any one serration or land never backs exactly at the same spot because of the difference in length between the abrasive belt and the contact belt. This method of backing the belt gives a cool aggressive cut with little abrasive loading and the continual flexing of the entire belt acts to automatically unload any of the small amount of loading that may occur. Since much less pressure is required against the work piece, operator fatigue is greatly reduced.

Finer grit belts cannot normally be used on conventional edge sanders because they tend to burn the wood instead of cut, but the contact belt



Edger with 4" x 226" abrasive belt. Tables on side and on the end are adjustable. Contact belt and abrasive belt have independent tension and tracking controls. Guards are in place and machine is ready for operation.

does permit the use of finer grits because of the more aggressive cooler cutting action. This results in improved finished surfaces.

A serrated neoprene covered sanding belt idler can also be furnished to take advantage of this principle for sanding arcs on the end of the Curtis 91.

The serrated contact belt and contact wheel which have proven themselves in metalworking applications have been successfully engineered into the Curtis 91 serrated contact belt edger for the woodworking industry, and represent a nice dividend on the many contributions the woodworking industry has made to metalworking in the past half century.

Spray Painting Protects New Lumber

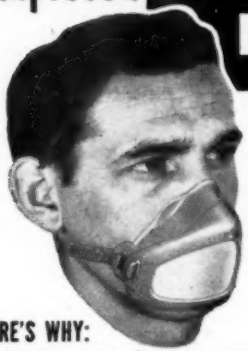
Spray painting which long has been regarded as an ideal method for application of paint to wood structures is now protecting and sealing new lumber before it is incorporated into any type of construction.

Mauk Warehouse, Inc., Toledo, Ohio, wholesale lumber dealer, is now spray painting the ends of all lumber which is stacked out-of-doors. This protective method was instituted several months ago because hundreds of dollars were lost due to end checking of the wood.

At present, the company is using a bright green enamel which is spray-applied by a DeVilbiss gun. Compressed

Bright green paint protects lumber and identifies Mauk's products.

THE Improved **FLEX-A-FOAM DUST MASK**



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air for the operation is brought right to the painting site with a DeVilbiss portable gas-engine-driven compressor.

In addition to saving the company hundreds of dollars, the painting system also protects the customer, assuring him of a better grade of lumber.

The Mauk concern serves about 300 retail lumber yards in the Toledo trading area, with these companies now selling their customers an identified protecter product.

The new idea of protecting the lumber will get its real test during the hot summer months when lumber ends lose their moisture rapidly.

A "highbrow" is a person educated beyond his intelligence.

to up-to-date information

about equipment and supplies as featured by our advertisers in this particular issue. All of our advertsers will be glad to send information about their products, but we have listed the following firms because they have mentioned booklets in their advertising copy.

If you wish, circle the booklets you wish to receive and send to Readers' Service, WOOD WORKING DIGEST

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Greenlee Tool Co., page 102, Catalog 34-M.

CLAMPS
Cincinnati Tool Co., page 60, Catalog.
J. L. Taylor Mfg. Co., page 94, Catalog.

CUTTERS & KNIVES
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Upson Company, page 114, Sample.

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ROUTERS
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National Air Sander, page 156, Catalog.

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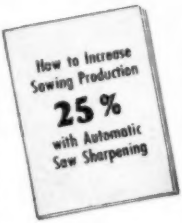

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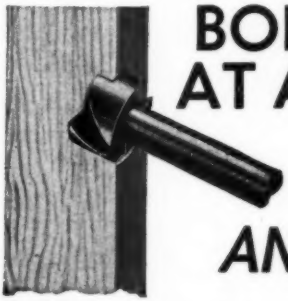


BORES AT ANY ANGLE

Forstner Bit

Because it is guided by its circular rim the Forstner Bit bores at any angle . . . even against the grain and into knots, leaving a true polished surface. In machine shanks from ¼" to 3". Order from your distributor today.

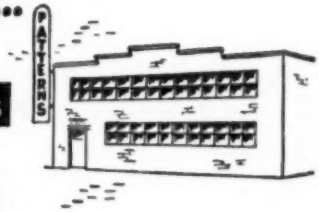
CONNECTICUT VALLEY MFG. CO.
CENTERBROOK, CONNECTICUT

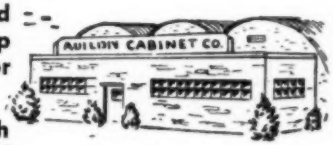
Mechanics Through the Ages

TO MINIMIZE THE BREATHING IN OF DUST — AND TO MAKE
TOOL SHARPENING EASIER — — BRITISH MACHINE SHOPS OF THE MID-1800's PROVIDED INCLINED PLANES LEADING FROM FLOOR TO THE TOPS OF THE GRINDSTONES SO THAT THE WORKMEN COULD LAY FLAT ON THEIR STOMACHS WHILE GRINDING, WITH THEIR HEADS ABOVE THE STONES - -
IN HOLLAND,
IT TOOK MANY GUILDS TO TURN OUT ARMS AND ARMOR FOR WARRIORS OF THE MID 1500's.
THERE WERE SEPARATE GUILDS FOR THE MAKING OF PLAIN-ARMOR, CHAIN-ARMOR, HELMETS, SWORDS, CUTLERY, GUN-BARRELS, GUNS AND PISTOLS
IN THE 1740's MANY OF THE BLACKSMITH SHOPS OF BIRMINGHAM, ENGLAND, EMPLOYED WOMEN TO WORK AT THE ANVIL, POUNDING OUT NAILS..
Al Reet

Good News Gets Around...

Moak Hand Planers and Jointers





FOR FAST-FEED, VIBRATIONLESS PRODUCTION ON DOZENS OF SHOP JOBS

You get more for your money in Moak Hand Planers and Jointers, the indispensable shop tool for jointing, planing out of wind; for chamfering, rabbeting and beveling.

Tungsten steel knives are fitted in the high carbon alloy steel cylinder head, the head mounted in self-aligning ball bearings enclosed in dust-proof housings. Available in sizes for planing 12″ and 16″ lumber; equipped with ½″ rabbeting groove, adjustable bevel gauge and hand brake for safety.

Get the facts **on Moak Hand Planers and Jointers right away. Write for our illustrated descriptive and specification folder.**

The Market Place

Rates for Classified Advertisements

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of $7.50 for name and address and a five line advertisement. For additional lines, only 75c per line.

DISPLAY ADVERTISEMENTS: 1 inch (Minimum), $8.50; 2 inches, $17.00; 3 inches (Maximum), $25.00.

Write directly to those offering the machine for sale, for prices and full descriptions. If what you seek is not advertised, write Hitchcock Publishing Company, 222 E. Willow Ave., Wheaton, Ill., making known your wants on either new or used machinery and the publisher will gladly assist you.

FOR SALE

S. W. Harrington, Inc.

P.O. Box 230 **Asheville, N.C.**

Air Compressors, various sizes
Band Saw, Greenlee No. 410, 36" bb, dmd
Band Saw, New Delta 20" bb-dmd
Band Saw, F&E No. 50—36" bb v-belt & motor
Blowers Garden City 55"
Borer, Andrews 3 spdle. vert. bed
Borer, Greenlee 369-4 ft. m.d.
Borers, Greenlee No. 370 6 ft. horiz. dmd
Borers, Moak SS 2 Spindle horiz. dmd
Borer, W&M 283-B, bb, dmd, sgl. spdle.
Boring & Sawing, McKnight 26F dmd
Clamps, Handy No. 71 revolving
Clippers, Coe 88" bd. and motor
Dovetailers, Dodds, 20 spindle
Frequency changers, 30 KW dmd
Glue Jointer, Diehl No. 66 bb.-dmd
Glue Jointer, Jenkins No. 343A bb-dmd
Glue Spreaders, 12" Black Bros. dmd.
Jointers Glue, Yates-American No. 213 bb-dmd
Jointers, New Moak 12" bb-dmd
Jointers, Porter 16" and 24" bb-dmd
Kiln Trucks, 4' & 6', roller bearing
Lathe, Yates No. 74 bb-dmd
Mortiser, Sidney, single-spindle pb. bd.
Mortiser, New Britain No. 7 bd. & motor
Mortiser, W&M No. 238—5 spindle Horiz. dmd.
Moulders, Mattison No. 222, 6" bb-dmd
Moulders, Vonnegut 12" bb. dmd.
Moulders, Yates-American C88, 8" bb dmd
Moulders Yates-American C-89—6" bb-dmd
Planers, Oliver No. 169, 30", dbl. bb, dmd
Planer, Facing, Yates-American 36" with Jackson & Church feeder on base, bb-dmd
Planers, F&E—30" double, pb. bd. & motors
Planers, Whitney No. 24—30" dbl. b.b. dmd.
Planers, Berlin 36" round head dmd
Planers, New Crescent 24" bb-dmd
Planer, F&E No. 156 36x7 dmd. round head
Planer-Matcher, Yates A1-15"x6" round heads pb. bd.
Redrier, Merritt 12 plate 36x72
Routers, Defiance single spindle high speed dmd
Sander, Yates No. 430, semi-stroke, bb, dmd.
Sander, Yates No. 431—43" 3 drum endless dmd
Sander, Solem 2 drum endless 36" bd.
Sanders, Niagara brush, bb-dmd
Sander, 48" double disc, dmd
Sander, Smith 49" 3-drum endless bed, bd.
Sanders, F&E 60" 3-drum roll feed, dmd
Sanders, McKnight single drum 24"x16" dmd
Sanders, Porter Cable vertical oscillating dmd sgl. spdl.
Sander, W&M No. 171 belt bb., m.d.
Saws, F&E No. 500 variety bb-dmd
Saws, Greenlee No. 493, variety, bb, dmd
Saws, Hermance Gang Rip, pb. & motor
Double Cut Off Saw, Jenkins 105-A 60x96 with copes, bb, dmd
Saws, New Delta-Crescent 12" tilting arbor dmd
Saws, New Multiplex 40A & 50A
Shaper, Defiance double spindle, bb-dmd
Shaper, Whitney No. 389, double bb-dmd
Shapers, New Moak single spindle bb-dmd
Shapers, Greenlee No. 180 double bb-dmd
Shaper, Whitney double spindle, bb., md.
Sticker, American No. 1, 1 side 4" pb. bed
Taping Machines, Dennis No. 2
Tenoners Yates-American No. 55 sgl. end, bb-dmd
Tenon Heads, single and double end
Tenoner, Hayes 6 ft. dbl. with copes, pb. bd. & motor
Veneer Press, Francis 84x48

Many other items. send your inquiries

42" Tannewitz Band Saw Direct-m-dr. American auto. Hollow Chisel Mortiser No. 139 Whitney 2 Spdl. Shaper Direct-m-dr. with frequency changer. Close-out prices.

JAKOBE LUMBER CO.
MANKATO, MINN.

CARBIDE TIPPED BARGAINS

We offer fine lot first quality solid milled shaper cutters. Carbide tipped at very low prices. Send for pattern list today.

PALMER MACHINERY COMPANY
Box 87 **Jacksonville 1, Florida**

L. R. Kenner

3325 Trinity Road Louisville 6, Ky.

Borer, 48" Bell No. 205 horiz. multiple head
Cutter Grinder, Mattison No. 231 motor drive
Planer, 30" Whitney sgl. sq. head, with motor
Router, Ekstrom-Carlson No. 232, 5 h.p. motor
Sander, 48" Smith No. 404 end. bed, BB, M.D.
Sander, 49" Yates No. 431 end. bed, BB, M.D.
Cut-off Saw, Diehl No. 88 Str. Line

Clifton Machinery Co.

1623 W. 6th St. Cincinnati, Ohio

Saw Dust and Shavings Mill Exhausters and Blowers—Hundreds in stock, sizes to suit any need. Also Air Compressors, Fans, Rotary Blowers, Money Savers—Send specifications.

All machines rebuilt and fully guaranteed.

FOR SALE

Woodward Machinery Company

309 E. Second St. Cincinnati 2, Ohio

Band Saw, Parks 22" M.D. $85.
Belt Sander, Mattison No. 131, hand block, $185
Blowers, New 20 in., BB., $55
Blower, Garden City, 30 in., $65
Borer, Bell dbl. end, $300
Borer, Bell gang, dbl. end, dowel, $300
Borer, two Sp. ver., MD., $175
Carver, ball bearing, sgl. $75
Clamp, Handy No. 50 Drawer and Case, $125
Clamp, Handy, 7½ ft. revolve glue, $300
Cut off saw, Foot pedal, MD., $125
Dowel Mach., Bell No. 4, power feed, $250
Dowel Pointer, Bell gang, $300
Jointer, New 6 in. Bench, $45
Mortiser & Borer, American horiz. 5 hp, HC MD, $300
Planer, Egan 24x6 Pony, $250
Radial saws, Dewalt 2 to 5 HP, sgl. and 3 ph., $185 up
Router, Ekstrom No. 327, BB, $600
Sander, hand block belt, MD., BB., $150
Sander, Nash dowel and handle, $300
Saw, Roll table cutoff, $75
Sticker, Smith 6 in. 4 side, $175
Swing Saw, Towsley DMD BB, $150
Tenoner, American No. 2-1-2 sgl. cope and Mtr., $250
Variety saw, heavy duty, with jointer, MD., $175

Taylor Panel Flow Machine, 66"x10', with Taylor automatic cut-off saw, boiler, complete. Almost new. Immediate delivery.

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Poland, N. Y.

NEW & USED REBUILT

Bandsaws, planers, tenoners, mortisers, sanders, self-feed rip saws, clamps. Send for our complete stock sheet.

AMERICAN MACHINERY EXCHANGE
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Whitney 30" Double Planer four knife round heads, ball bearing, sectional double rolls, 20 and 10 H.P. motors, starters, electric grinder, V-belt drive. Low price of $1900.00 F.O.B. Chicago.

Sash check rail slotter and tenoner
Sash clamp, Greenlee 602, quick acting
Sash sticker, single head, ball bearing
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Sash Plow and bore machine
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Resawing attachment for band saws
Boring machines. 6 spindle horizontal

Many other woodworking machines.

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Yates-American A-21 BB Planer, Dble. Profile.
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Woods No. 404 D Electric Double Profile, Planer.
American No. 77 B Planer 8K Double Profile.
Diehl No. 55 Straight Line Ripsaw.
Whitney No. 24 36" Dble. BB Electric Surfacer.
Wilkin-Challoner No. 70DE Electric Tenoner.
Mattison No. 202 Straight Line Ripsaw, 15 HP.
Hermance No. 36 Straight Line Ripsaw, 10 HP.
Diehl No. 660 Continuous Feed Glue Jointer.
American No. 111 BB Resaw, 54" Tilt Rolls.
Mattison No. 222 8" Electric Moulder.
Jenkins No. 96 BB DE Tenoner.

These and many others in our warehouse.

R. K. HASKEW & CO., INC.
CHATTANOOGA 5, TENN.

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2—WA50A Onsrud Automatic Shapers and Routers with air clamps and accessories.

KENNEDY BROTHERS
BRISTOL, VERMONT

New equipment of present type—never installed. Immediate delivery at Louisville.

1—Berthelsen 50x100" four-opening hot plate press; side loading.
2—10" Curtis Model 43-R3 Hydraulic Stroke Belt Sanders.
2—American "Uni-Point" Radial Saws.

L. R. KENNER
3325 Trinity Road Louisville 6, Ky.

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PRICED FOR QUICK SALE FROM STOCK

JOINTERS—20" No. 1 American, ball bearing
24" American Billstrom Swingout Feeder
30" American Swingout Feeder
12" H.B. Smith direct motor drive

MORTISERS—New Britain Chain Saw
Fay & Egan No. 510 Hollow Chisel, like new
Greenlee No. 228 C.M.D. from motor

TENONERS—Fay & Egan No. 2 coupled drive motor upper-lower copes & C.O. 3 HP
Jenkins Model No. 95 Double End
Jenkins Model No. 90 Double End

LATHE—Mattison No. 57-B 42" with standard and hollow chuck feed

MOULDERS—Childs 2"x4" Electric Moulder
9" No. 375 Fay & Egan ball bearing
Yates No. 108—10" 4-side moulder with 50 HP motor
Fay & Egan No. 209 ball bearing moulder

SURFACERS—Whitney No. 105—24" DMD with variable feed
30" No. 32D Smith ball bearing single
No. 490 Fay & Egan 24" single

SHAPERS—No. 2½ American ball bearing, double spindle DMD with freq. changer
Whitney Double No. 9-A ball bearing belted vertical motor drive.

BAND SAWS—30" No. 135 ball bearing v-belted drive Fay & Egan

CUT-OFF SAWS—Multiplex 5 HP radial saws, radial arm ball bearing
No. 452 Greenlee automatic
Mereen-Johnson ball bearing, chain feed, double cut-off, 4-motor drive

RIP SAWS—Sinker-Davis self-feed rip

VARIETY SAWS—Tannewitz tilt-table
Smith model 338 ball bearing

SWING SAWS—Holmes 1½ HP motor
Eaglesfield ball bearing DMD

SANDERS—Schipper-automatic turning sander-head & tailstock for automatic loading No. 393 Fay & Egan 42" endless bed, 3-drum

SHAVING EXHAUSTERS—Buffalo 30" single
Buffalo double, tandem dr., 30"

SPECIAL SYSTEM—Porter 24" B.B. Jointer facer—power feeder—Porter conveyor—Buss No. 4—30" eight roll double surfacer

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Single Machine or Entire Plant. All makes, models, sizes
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FAY & EGAN CO. • Tele. **PL-0730**
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Factory Rebuilt Machines

Vonnegut 6" Direct Mtr. Dr. B.B. Moulder
Hall & Brown No. 215 8" B.B. Moulder
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Fjellman & Winther Hot Plate Press, 50"x80"
Berthelsen Hot Plate Press, Three Openings, 44"x72"
Black Brothers No. 22D 26" dble. glue sprdr
Black Brothers No. 22D Bench Mod. Glue Spreader, 26" Double
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Clement 16" Jointer, Direct Motor Drive, Round Head, Ball Bearing
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Jenkins No. 123 Gang Style Borer
P.B. Yates No. 431 67" Three Drum Endless Bed Sander
Berlin No. 401 61" Roll Feed Sander
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Paxton Eight Track Nailer, closed back, 1951 Model
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Many other machines available.

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For quick sale!

One No. 4 Hawker Dowel Machine w/15 HP 220/440 v.—3 ph.—1730 RPM motor
One No. 3 Hawker "Money Maker Adjustable" Dowel Machine w/10 HP, 220/440 v.—3 ph.—1750 RPM motor
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SEVERAL MACHINES ALMOST NEW!

CLOVERLEAF-FREELAND CORP.
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Andrews Ball Bearing 10' Open Back Borer with 13 spindles, direct motor driven with 10 HP 440 volt motor $1,650.00

CHISM & BURTT MACHINERY CO., Inc.
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Dependable 10" all electric moulder, 4 sides, 3 yrs. old.
Yates C4A—8x4—4 Side belt driven Moulder with 15 H.P. motor and compensator.
Mattison No. 303—8' Auto. Hyd. Stroke Sander
Buess Tilting Table Variety Saw
Berlin No. 282 Band Rip and Resaw—Good cond.
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Only GENUINE parts
WILL KEEP YOUR
Jenkins
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GENUINE JENKINS PARTS ARE MANUFACTURED AND STOCKED EXCLUSIVELY BY

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Fine, Medium Priced
Tru-Form
SHAPER CUTTERS

Tru-Form denotes precision shape which never changes in grinding, plus flattened-arc relief for faster cutting and reduced heating, adding up to 50% longer life. Razor sharp. Deep-hardened tool steel. Bulletin S-1 lists over 50 shapers stocked, including sets for sash, door and cabinet work.

Insist on Boice-Crane Tru-Forms. Your Dealer has or can get them.

BOICE-CRANE COMPANY
931 Central Avenue Toledo 6, Ohio

IMMEDIATE DELIVERY
New Tannewitz Type U M.D. Tilting Arbor Saw
New Delta 3 H.P. 3 phase Radial Saws
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New 20" Delta ball bearing Band Saw
New 36" Delta ball bearing Band Saw D.M.D.
New Unisaws single and three phase
New Parks 12" Planer
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Wood turning plant, completely equipped, ready for immediate production. Buildings in good condition. Three acres land. Labor available. Orders on hand to be processed.

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CHARLEMONT WOOD TURNING COMPANY
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WOODWORKING FURNITURE MEN
$6,000 - $20,000

We are in touch with wood products manufacturers, nationwide, who are interested in finding competent men in Factory Management, Supervision, Engineering, Administration and Sales. If you are not employed to your best capacity or have a desire to change location, write confidentially to

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One excellent reconditioned Yates-American 35 - 7" Electric Moulder, with built-in 10-10-10-7½ spindle motors, with separate motor to selective gear box. 100% ball and roller bearing, and complete with 25 KW Frequency Changer to operate at 6,000 rpm. Has been put through rebuilding shop and is fully guaranteed. Priced to sell.

Your inquiries solicited for good clean used tools.

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Motor Driven
FREQUENCY CHANGERS
IN
STOCK

Sizes: 10 to 60 KW
Outputs: 90-100-120 and 180 cycle
Reliably Rebuilt
1 YEAR GUARANTEE
Attractively Priced
SAVE MONEY when you BUY any ELECTRICAL EQUIPMENT
We actually have one of AMERICA'S LARGEST STOCKS
Send us your Inquiries.

L. J. LAND, INC.
Est. 1910 (45th Year)
Corner Lafayette & Grand Sts.
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Man 40 or under with engineering degree or equivalent and experience in timestudy and methods work in woodworking industry. Will work with industrial engineering group in one of South's best known and most modern wood products manufacturer.

Reply, giving age, experience, education, and salary requirements to Manager, Salaried Employment.

The Brunswick-Balke-Collender Co.
Marion, Virginia

FOR SALE
KILN DRIED CABINET WOODS

Any quantity up to car-load lots. Immediate delivery or pick-up. Walnut, Cherry, Red and White Oak, Mahogany, Northern Birch, White Ash, Hard Maple, Poplar, Basswood, Prima Vera, Idaho White Pine, Red Gum, Cypress.

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Wanted—Factory Superintendent

Thoroughly qualified superintendent for a chair and upholstery plant. Responsible for complete machine, assembly, finish (conveyers) and upholstery departments, involving dining room chairs, small tables, sofas and lounge and miscellaneous chairs. Prefer one with upholstery knowledge, but not essential. Must have had top experience in all phases of production, costs, incentives, product engineering, scheduling.

Only mature competent applicant will be considered as this is an opportunity for long term advancement.

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HOLLAND, MICHIGAN

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2 Food Machinery—Open Back—12 Tr. 2 Row—L-Shape—Cltng. M.D. @ $950
1 Doig 45-36 Open Back $2750
1 Doig 8 Track—Closed Back .....$ 250
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1 145 Mereen Johnson Boxboard Resaw—50"x5¾" wheels $1000

EXHAUST FANS

400 CFM Harris 1/3 HP—110V ....$ 40
30 In. Steel Plate BB .....$ 135
No. 40 Bayley 50 in. high BB $250

HARRIS MACHINERY COMPANY
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WANTED

110 Inch Veneer Lathe and Clipper Either Merritt, Coe, or Capital. Also interested in Drop Clippers of various sizes, Diehl Joiners, Splicers, and Dennis Taping Machines. Advise what you have available on this and other Veneer and Plywood Equipment.

Address replies to Box 159
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POSITION WANTED

As a plant superintendent in a well established line of upholstered furniture. 20 years experience in furniture business, the last 10 years in supervising all phases. Last 5 years as a general plant superintendent. Now employed.

Reply Box 157
c/o WOOD WORKING DIGEST
Wheaton, Illinois

TUMB-L-MATIC BULLETIN

A new two-color bulletin, offered by Tumb-L-Matic, Inc., describes and illustrates LS tumbling barrels, for large scale, low cost finishing operations. These single-tumbler barrels employ the dry process to cut down, deburr, and polish metal, plastic, hard-rubber and wood parts.

The bulletin includes recommendations for selecting specific abrasive compounds to use in various tumbling operations. Detailed information on barrel sizes, drives, controls, liners and optional equipment is presented.

Photographs illustrate two models of the tumbling barrels and explain overhead gear motor drives. A table of specifications gives standard model numbers, tumbler sizes and number of compartments per barrel.

Copies of Bulletin LS-55 may be obtained by writing Tumb-L-Matic, 4510 Bullard Ave., New York 70, N.Y.

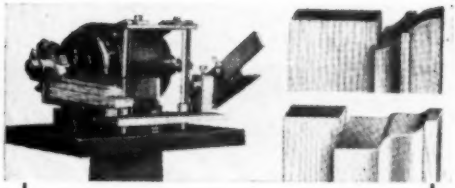
MOISTURE PRECAUTIONS

The Maple Flooring Manufacturers Association has announced the availability of a leaflet which explains the rules to follow in eliminating moisture and expansion from kiln-dried hardwood flooring.

The text of the leaflet, "Please Don't," is in two parts. The first contains suggestions for the installation and care of Northern hardwood flooring, with special emphasis on the allowance for expansion, damp season ventilation and preliminary handling of flooring before laying.

The second part of the leaflet contains a list of simple precautions to take in handling hardwood flooring at the job site. The leaflet also deals with the subject of nails and lists the sizes and kinds recommended for fastening Northern Maple and Birch flooring.

Copies are available upon request to the Maple Flooring Manufacturers Association, 35 East Wacker Drive, Chicago 1, Ill.



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Fast, clean, accurate production, with solid steel cutters revolving at 3600 R.P.M. For divided light and fancy sash 1⅛", 1⅜" and 1¾" sizes.—One-half H.P. single or 3 phase motor.—Foot treadle available for divided lights on heavy doors.

Write for Catalog of complete line.

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Northfield 27" DMD Ball Brg. Bandsaw
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Handy No. 401 Air Operated Rev. Case Clamp, 74"
Dodds 12-Spindle Dovetailer, mtr. dr.
Solemn SE3-M 48" Mtr. Dr. Endless Bed Sander
Vonnegut 6" Electric Ball Bearing Moulder
Hermance E-1—6"x4" B.B. Molder, Belt Dr.
Yates-American No. 35—9" Elec. Moulder
Yates-American C89—6" Electric Moulder
Greenlee No. 227-BM M.D. Auto. Mortiser
Whitney No. 32—30" Motor Drive Ball Bearing Single Cabinet Planer
Diehl No. 75 DMD S/L Ripsaw
Mattison No. 207 DMD S/L Ripsaw
Ekstrom-Carlson No. 327 Electric Router
Whitney No. 134 DMD B.B. Dbl. Sp. Sharp.
Whitney No. 295 DMD B.B. Auto. Shaper
Smith 42" Motor Dr. End. Bed Sander
Mattison No. 157 DMD Double Belt Stroke Sander, 8 ft.
Peerless 14" Horiz. Belt Sander, mtr. dr.
Whitney No. 24—30" M.D. B.B. Dbl. Pl.
Wilkin-Challoner B.B. M.D. Sash Sticker
Diehl No. 89 Tapeless Veneer Splicer

GUSTAFSON & SCOTT MFG. CO.
1627 N. Lowell Ave. Chicago 39, Ill.
Phone SP 2-8680

buyers' service

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If you will list below the wood-working machines, supplies or machine shop equipment in which you are interested and mail this page to us, we shall be glad to refer your needs to the manufacturers or others in position to serve you. Replies will come from them — not from us.

If you have any special shop problems let us have the details. Often we can make helpful suggestions.

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Oliver No. 173 Jig Saw, 36", Motor drive
Crescent 36", V-Belt, Motor Drive
American 42", V-Belt, Motor Drive
Silver 20", V-belt motor drive

BAND, RIP AND RESAW
McDonough 62", vertical band resaw
Mershon 42" Twin Band Rip, B.B.

BORING MACHINES
Jenkins No. 123 Gang Stile Borer and Motor
Bell No. 24B Double End Bor., Chuck, & c/o
Rogers single spindle, horizontal
McKnight No. 28-F, double end, M.D.

BLOWERS AND FANS
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American No. 80-E with 40 H.P. coupled motor

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Greenlee No. 599 frame and furniture clamp

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Covel Hanchett OK 42" Knife Grinder, M.D.
Wardwell Y-18 Circular Saw Filer, M.D.

JOINTERS
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Yates No. 199, 20" round head V-belt M.D.
Porter No. 300 CM, 12", D.M.D., B.B.
Porter Style C 12" Round Head, M.D.
Meyers continuous feed, V-belt, M.D.

LATHES
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Oliver No. 25 20"x12' Bed Pattern Makers Lathe
Smith B-42 Ball Brg. Auto. Variety Lathe

MORTISERS
Wysong & Miles No. 284 Auto. Hollow Chisel
Greenlee No. 227 hollow chisel, mtr. driven.
Sidney No. 707 Chain automatic feed M.D.
Sidney 705 Hollow Chisel Automatic feed, M.D.
Whitney No. 67 Oscillating Belt, M.D.
New Britain No. 2 Chain with motor

MOULDERS
Vonnegut 6" All Electric
Yates-American C-89, 12" All Electric
Woods No. 134-M 4" Electric
Newman 4x4, All Electric
Yates No. 108, 10" belt drive coupled motor
Yates-American C-89, 6" All Electric
Woods No. 132 M 6" Electric

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Whitney No. 32 24" Single, Ball Bearing, M.D.
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Yates No. 156 30" Single, Ball Bearing, M.D.
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Yates No. 156 20" round head, M.D.
Yates No. 177 30"x12" double M.D.
American No. 80 15" double, heavy duty

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Ekstrom-Carlson No. 126, B.B., M.D.

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Whitney No. 239 Double Spindle, D.M.D.
Porter No. 103 single, ball bearing, M.D.
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Whitney No. 47A, dbl. spdl., short belted m.d.
Greenlee No. 180 double spindle, D.M.D.
Whitney No. 250 Double Spindle, D.M.D.

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Yates-Amer. No. S-23 43" 3 dr. roll feed D.M.D.
Yates No. 421 6-drum with motors
Fay & Egan 30" 2-drum end. bed., M.D.
American No. 2 Disc and Spindle Combination

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American No. 1 Tilt Table, V-belt drive.
Whitney No. 61 tilting arbor, D.M.D., B.B.
Walker Turner 10" Tilt Arbor, B.B., M.D.

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Oliver No. 94-D Straight Line, Motor on arbor
American No. 51 swing saw, M.D.
Multiplex No. B-60 radial arm, 7½ H.P. motor

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Greenlee No. 426 Roll Feed with motor

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Jenkins No. 95 double-end, D.M.D.
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Mattison No. 124 Automatic Stroke Sander
Mattison No. 137 Motor Driven Ball Bearing Belt Sander.
Pearson Waterfall Sander
Oakley Model E Double Sander
Yates-American 43" No. 433 Direct Motor Driven Ball Bearing Endless Bed Sander

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Dependable No. 1 BB Gang Rip Saw, Power Feed

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Yates-American U-9 Electric Router

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Whitney No. 234 Double Spindle Electric Shaper
Onsrud W-125 Double Spindle Automatic Shaper
Onsrud W-125 Single Spindle Automatic Shaper

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Wilkins-Challoner No. 70 Elec. Dbl. End Tenoner
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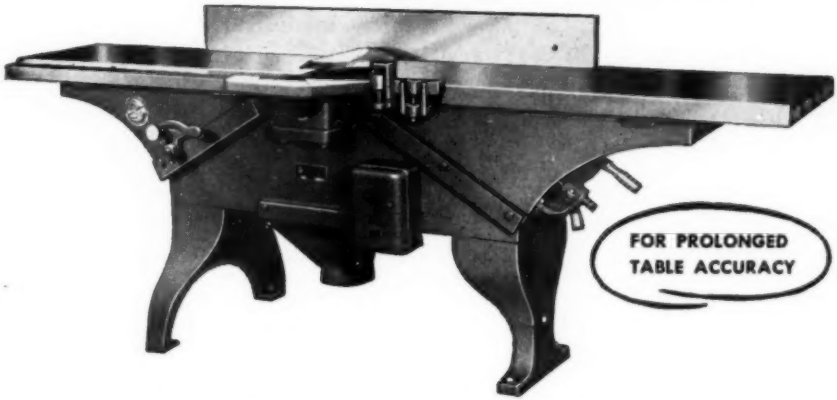

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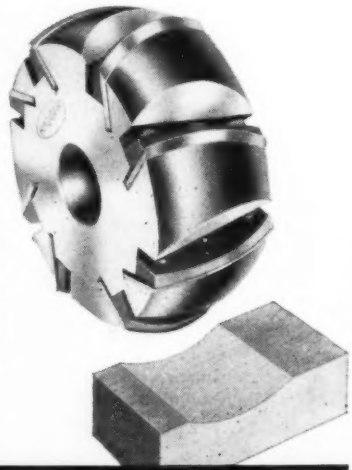

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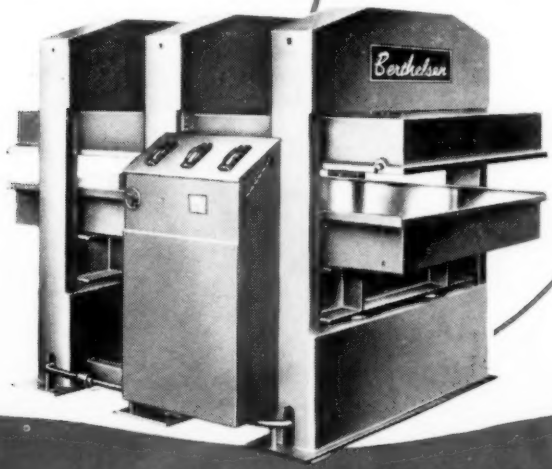

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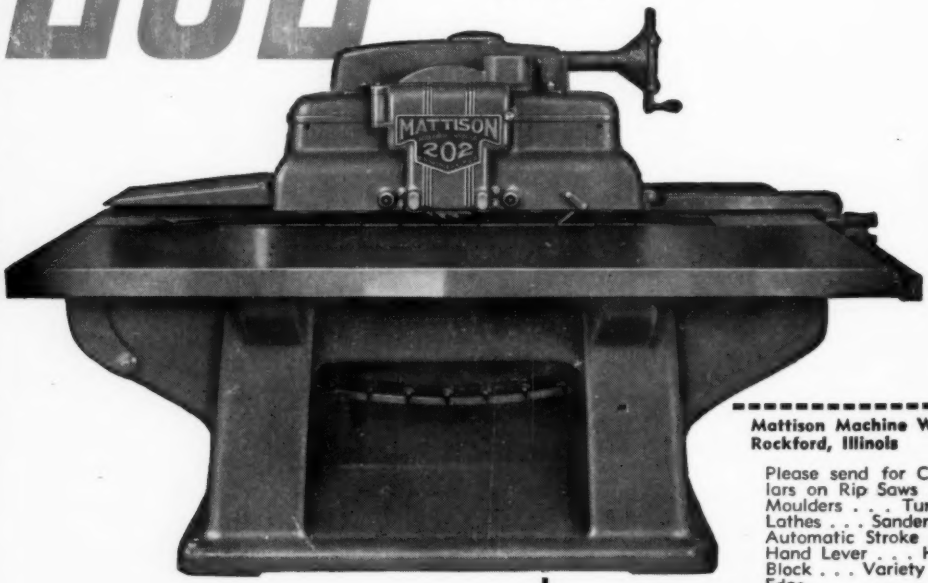

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